VETERINARY MEDICINE

features in this issue...

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Preservation of Hog Cholera Virus at Low Temperatures

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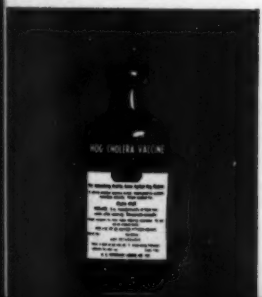

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An Outbreak Of Tick Paralysis In Cattle In Western Montana*

W. L. JELLISON,** Ph.D., H. G. STOENNER,† D.V.M.,
N. J. KRAMIS,** and H. F. BEARDMORE,†† D.V.M.

ON Friday, April 7, 1950, at noon, J. B., a rancher near Perma, Mont., was informed by a neighbor that one of his Hereford yearlings in a distant pasture was down and obviously in distress. When the owner arrived about two hours later ten animals had collapsed and by 4 p.m. a total of 31 out of a herd of 68 yearlings were down and in a more or less helpless condition. No other animals were observed to collapse after 4 p.m.

The owner was alarmed at this sudden catastrophe. A few animals were loaded in a truck and taken to Dr. R. D. Read, veterinarian at Ronan, Mont., who noticed the heavy infestations of wood ticks, *Dermacentor andersoni*, and suggested that the cattle were affected with tick paralysis. As Doctor Read was unable to go to the ranch and administer treatment, veterinary assistance was obtained from Dr. F. L. Metcalf at Missoula. From early evening till midnight the veterinarian and owner worked on the stricken animals with hand sprayers and daubers, applying insecticide to the tick-infested areas. Some of the animals found on the range were daubed with undiluted insecticide.

Two hundred fifty head of cows and calves belonging to the same rancher were in a nearby pasture but were unaffected. J. B. had run cattle in this area for many years. No such outbreak had occurred previously.

Doctor Read, who was first consulted and suggested that the cattle were affected with tick paralysis, was called the same day to see a herd of cattle near Polson, Mont., where seven yearlings were paralyzed. These were deticked and recovered promptly without fatalities.

When the writers arrived at the ranch at noon, April 8, many of the stricken animals had improved and were again on their feet, but at least 13 animals were still helpless in the truck, out on the range, and in the corrals. Some of these had been overlooked the previous evening and had not been treated. All animals still out on the range were trucked in to a shed where they were watched for the next few days until they either recovered or died.

Stricken yearling Herefords in truck 24 hours after onset of paralysis.

On April 12, this ranch was visited again and it was found that only three of the animals had died. One died at the corrals and the two others had recovered sufficiently to move ¼ mile away from the corrals. One was found dead in a small stream. The owner

*From the Federal Security Agency, Public Health Service, National Institutes of Health, National Microbiological Institute.
**Rocky Mountain Laboratory, Hamilton, Mont.
†Communicable Disease Center, Atlanta, Ga.
††Montana Livestock Sanitary Board, Helena, Mont.

stated that if he had been physically able to stay with these weakened animals and give them constant attention, probably no fatalities would have occurred.

The significant history of this herd of yearlings is as follows:

They had been wintered at the home ranch. On March 14, they were sprayed with a DDT-rotenone mixture for louse control. On March 22 or 23, they were moved out to pasture. Range forage was scant and though the animals were thin, they were not in poor condition. No unusual illness was noted in any of them until the day of the outbreak.

J. B. Ranch on the Little Bitterroot, near Perma, Lake County, Mont. Site of tick paralysis outbreak.

According to the owner, the weather had been cold for several weeks but on April 6 it was warmer and April 7 was an especially warm day for the season. This may have affected the rate of feeding of the ticks and precipitated the rather climactic results; but this is only supposition. A five to ten day period is ordinarily required for this species of tick to engorge. Therefore, the number of completely engorged female ticks found on the animals indicated that the infestations had started at least seven to ten days before the epizootic and probably as soon as the cattle were turned on the range.

Symptomatology

In the less affected yearlings, the chief symptoms were incoordination and unsteadiness of gait. When moved, they walked as though intoxicated, changing direction abruptly to maintain balance. Weakness in the rear quarters was apparent. One yearling which was approached while recumbent, got to its feet and ran about 300 yards; then collapsed. With assistance, it regained its feet and, though staggering, promptly charged one of us. Accompanying this aggressive or belligerent spirit were prominent bulging of the eyes and an expression of anxiety or terror.

The more severely affected animals were completely paralyzed, lacking even the ability to hold up their heads. The temperature of these animals varied considerably, depending on the extent and duration of the paralysis. Temperatures of the most severely affected animals were subnormal. The fact that these animals had been drenched by a cold rain may have contributed to the subnormal temperatures. Respiration and pulse rates were correspondingly depressed. Red blood cell counts and leukocyte counts of the affected animals were within normal ranges. (See table 1.) Blood samples from ten of these animals were tested for agglutination of *Brucella abortus* and *Pasteurella tularensis* with negative results.

Tick Infestations

Wood ticks, *D. andersoni*, were concentrated on poll, neck, and shoulders of the affected animals. Though heavier infestations without paralysis have been observed on other occasions, ticks removed from eight of these animals demonstrated the degree of infestation. Counts were ten, 11, 29, 32, 36, 45,49, and 85 ticks, respectively. This included males, unengorged females, and females in all stages of engorgement. No attempt was made to recover all the ticks from any one animal and some ticks had already died and dropped off their hosts.

Many of these ticks were tested for infection by maceration and injection into laboratory animals. No infection was demonstrated in them.

On a return visit April 12, favorable areas in low brush and grassy hillsides where the

cattle had been grazing were flagged for ticks. This is done by sweeping a white flannel cloth (about 1 yard square) slowly over the vegetation. In three man-hours of flagging, 221 male and 248 female ticks, *D. andersoni*, were collected. This is a comparatively heavy tick population for the species.

Treatment

The prompt application of insecticide; chlordane 40% technical grade, no doubt checked the outbreak, for by the next morning most of the ticks on the affected cattle were dead. Many animals had recovered and were back on the range, and marked improvement of others was noticed during the day. Some of the cattle were given a second application of insecticide containing benzene hexachloride. The more severely affected animals that were still down on April 8 were given intramuscular injections of amphetamine sulfate by one of us (H.F.B.) and seemed to respond favorably to this stimulant.

One animal (no. 5 in table 1) was found on the range, down on its side on March 8. It had a temperature of 94 F. and was absolutely helpless. Chance of survival was considered negligible. Thirty-six ticks were removed. This animal was ear-tagged with a large paper tag before it was hauled to the corral. On March 12, this animal, identified by the ear tag, was running on the range with others of the herd and showed no residual effect.

A final application of waste crank-case oil was applied by the owner to many of the animals before they were returned to the range in spite of recommendations to the contrary.

Discussion

This outbreak of tick paralysis is comparable to smaller outbreaks that have occurred in the Rocky Mountain States and to larger outbreaks that have been reported in British Columbia. Isolated cases occur nearly every spring in man and domestic pets or livestock.

Moilliet[1] has reported two outbreaks in British Columbia with serious losses. One, in 1930, affected about 100 head of cattle in a herd of 900. Sixty-five animals died. In 1935, about

Paralyzed yearling Hereford on the range 24 hours after onset. Temperature 94 F. This animal recovered.

200 yearlings in a herd of 638 were affected and 26 died. He suggested that these sporadic outbreaks had increased in frequency and severity in recent years.

There are on file at the Rocky Mountain Laboratory numerous other reports of individual cases and small outbreaks of tick paralysis in cattle at Kalispell, Marion, Libby, Eureka, and Warland in Western Montana.

As has been stated previously (Jellison and Gregson[2]), "There has been much speculation as to the exact etiology of tick paralysis and some experimental work has been done in an attempt to determine this point. The most acceptable hypothesis is that a neurotoxin generated by the salivary glands of the tick is injected into the tissues by the female tick in its feeding process." There is no evidence that an infectious agent is involved in the type of tick paralysis found in this Rocky Mountain area. As Mail and Gregson[2] have pointed out, "The rapid recovery that usually follows early

TABLE 1. CLINICAL AND LABORATORY FINDINGS ON TEN YEARLINGS AFFECTED WITH TICK PARALYSIS

Animal no.	Location	Degree of paralysis	Temperature ° F	Cell counts		Serology	
				10^6 cmm. erythrocytes	10^3 cmm. leukocytes	Brucellosis	Tularemia
1	Corral	Mild	.....	7.1	6.28	Neg.	Neg.
2	Corral	Mild	.....	7.22	13.0	Neg.	Neg.
3	Shed	Complete	.....	7.7	7.96	Neg.	Neg.
4	Range	Complete	103	8.56	13.92	Neg.	Neg.
5	Range	Extreme—comatose	94	8.58	9.24	Neg.	Neg.
6	Truck	Treated—recovering	96	8.19	6.00	Neg.	Neg.
7	Truck	Treated—recovering	96	6.56	6.24	Neg.	Neg.
8	Truck	Treated—recovering	103	7.66	8.2	Neg.	Neg.
9	Truck	Treated—recovering	103	8.24	6.52	Neg.	Neg.
10	Truck	Treated—recovering	102.6	8.88	5.96	Neg.	Neg.

removal of the offending tick suggests mainly a very labile toxin as being the factor involved in the paralysis."

The multiplicity of infectious disease agents associated with the Rocky Mountain wood tick suggests that in any outbreak of disease accompanied by heavy tick infestations, these infectious agents should be looked for as they may be contributing factors. Tularemia, anaplasmosis, and tick-host anemia, a condition described by Jellison and Kohls,[4] should be especially considered in the diagnosis of such outbreaks. There is, however, abundant evidence that one or more engorging female ticks, *D. andersoni,* in the absence of infectious-disease agents, can produce a progressive motor paralysis, that in extreme cases is fatal.

This paralysis is sharply seasonal coincidental with the active period of the ticks in early spring. Application of effective acaricides or mechanical removal of the ticks relieves the condition promptly in all but the most severely affected animals. Adequate shelter of animals, good care and cautious use of stimulants may hasten recovery and mitigate losses.

Moving Picture Film

A series of 16 mm. moving pictures in full color were taken of this outbreak by N. J. Kramis and have been made into a titled film which runs about 20 minutes. A copy of the film is available at the Film Library, National Office, American Veterinary Medical Association, 600 South Michigan Avenue, Chicago, Ill.

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Patton Makes Third Trip to the Orient

April 10, Dr. J. W. Patton, East Lansing, Mich., departed for Indo-China *via* Europe and India. Business stops enroute will include ten days in Paris, and shorter periods in Turkey, Saudi Arabia and India. He expects to arrive in Saigon about May 1.

In 1946-47, Doctor Patton spent about a year in Formosa in organizing a veterinary service, including an animal quarantine station. At that time he was in the employ of UNRRA. In 1950, he undertook a mission to Korea. Arriving in Seoul the day before the country was invaded by the North Korean Army, he, like hundreds of thousands of refugees, accompanied the South Korean Army on its retreat south for several weeks before transport was available for return to the United States. On this retreat, great hardships were suffered and he literally, as well as figuratively, "lost his shirt."

On the current mission, which is to conduct an animal disease survey in Indo-China, Doctor Patton is in the employ of the U.S. State Department and enjoys diplomatic status. His work is under the aegis of the Truman Point Four Program. Mrs. Patton will join the Doctor in Saigon after a few weeks. She also will travel by the French airlines via France, Turkey and India. The Pattons' address for first class mail is in care of the U.S. Consulate, Saigon. Magazines, packages, etc., should be sent via the State Department, Washington, D.C.

▼ ▼ ▼

Dr. Raymond C. Klussendorf Joins Commercial Solvents Corporation

Dr. Raymond C. Klussendorf, Editor-in-chief of the *Journal of the American Veterinary Medical Association,* has resigned that position and accepted an appointment in the Research and Sales Department of Commercial Solvents Corporation. His headquarters will be in Terre Haute, Ind.

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The Use Of An Egg-Adapted Modified Canine Distemper Virus Vaccine Under Experimental Conditions And In The Field

VICTOR J. CABASSO,* Sc.D., ROBERT L. BURKHART,* V.M.D., and JOSEPH D. LEAMING,* V.M.D., Pearl River, New York

EFFECTIVE immunization of dogs against distemper was successfully realized by Laidlaw and Dunkin[1,2,3] as a result of their outstanding work during the late twenties. These authors prepared a formalin-killed vaccine from tissues obtained from puppies previously infected with distemper virus, and demonstrated that repeated injections of this material were followed by a state of resistance to infection. Subsequently, they showed that the immunity afforded was only partial and of a relatively short duration, and could be made of a more permanent nature only after inoculation of live virulent virus, administered under the protection afforded by the killed tissue preparation. This method of immunization was, and still is, extensively used for the immunization of dogs. However, the danger inherent to the use of live virulent virus and the possibility of inactivation of the virus in transit are well known to all engaged in the field of small animal medicine. These limitations have led several investigators[4,5,6,7,8] to attempt the adaptation of distemper virus to a foreign host in the hope of modifying it. Rabbits, guinea pigs, mice, chick embryos, and other laboratory animals were used, and some successful efforts were reported, but these were unconfirmed.

In 1939, Green and Swale[9] reported the successful immunization of more than 100 dogs that received a single injection of a ferret-adapted, living, modified virus. This method of vaccination was devised on the assumption that canine distemper virus undergoes a true modification when serially passed through ferrets and, after repeated passages, loses much of its virulence for the dog. It is rather difficult to understand, however, how a true modification could take place by serially passing a viral agent through one of its most susceptible hosts. Bodin[10] made a comparative study on the use of the Laidlaw-Dunkin and Green methods of vaccination with particular emphasis on the reactions with both methods and on the number of cases of distemper occurring as a result of vaccination. His observations were made on 464 dogs immunized by the Laidlaw-Dunkin virus-serum method and 380 dogs inoculated with Green's virus. Of the 464 dogs, 124, or 27%, reacted unfavorably to vaccination, and 23 dogs, or 5%, developed canine distemper although they received optimal post-vaccinal care. Of the 380 dogs that received Green's virus, 114, or 30%, reacted with disorders associated with the vaccination, and 15, or 3.9%, developed distemper. In dogs under one year of age, the rate of severe reactions for both methods was as high as 45%.

Vaccination of Mink

The first vaccination of mink against distemper was conducted several years after the successful immunization of dogs had been realized. In fact, up to 1932, there was scarcely anyone engaged in mink raising who would admit that an infectious transmissible disease of mink existed. Shaw,[11] in 1932, seems to have been among the first to describe and confirm by laboratory methods a severe distemper outbreak on a mink ranch. He also was the first to use canine distemper antiserum on susceptible animals which had not yet developed the disease, and claimed to have been successful in preventing and controlling further spread of the disease. Serum treatment, however, had to be repeated every three weeks for as long as the infection existed on the premises.

Pinkerton,[12] in 1940, reported use of a vaccine on several mink ranches where distemper was occurring. The vaccine was a killed preparation made, for use on each ranch, from tissues of animals dying of distemper on that ranch.

The only commercial mink vaccines available today are also killed tissue suspensions.

*Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

These killed preparations must be administered repeatedly at regular intervals to induce an adequate antibody level, and even then the immunity lasts only for a relatively short time. It must be understood that, for economic reasons, the average mink rancher does not attempt to immunize when he has no distemper problem. If the disease strikes, however, he is receptive to the use of vaccine not only to save the exposed animals but also to attempt to cure the sick ones. The disease progresses in animals already in the incubative stage no matter how potent the vaccine. Vaccines prepared from a killed tissue preparation, given prior to an outbreak, require several injections to be effective.

Egg Embryo Culture of Canine Distemper Virus

As already mentioned, several attempts were made to grow distemper virus in the developing chick embryo, most of which were unsuccessful. Haig,[13] however, reported the successful cultivation of Green's virus through 30 serial passages on the chorio-allantoic (c.a.) membrane of chick embryos, and later[14] reported that the virus had been maintained on the c.a. membrane for more than 90 serial passages. During this time, the egg-adapted virus was found to have become only partially attenuated for ferrets and to have lost none of its highly infectious characteristics for this species.

In a previous paper,[15] one of us reported, in studies initiated before the work of Haig appeared, the successful adaptation and modification of a strain of canine distemper virus on the c.a. membrane of the developing chick embryo. This is the highly vascularized and very thin embryonic membrane that almost entirely lines the inside of the egg shell in the very early stages of embryonic development and permits the embryo to "breathe." This chick-embryo-adapted virus strain was derived from the stock distemper virus originally isolated in these laboratories from a field case

TABLE 1. IMMUNIZATION OF FERRETS WITH DIFFERENT BATCHES OF CANINE DISTEMPER VIRUS, CHICK EMBRYO ORIGIN

Ferret No.	Reconstituted vaccine: egg passage level	Challenged with 1000 m.l.d. virulent ferret virus—Days after vac.	Result after challenge	
1	30th passage	28	Survived 50 days	
2	1.0 ml., i.p.*			
3	31st passage, batch 1	28	Survived 50 days	
4	1.0 ml., i.p.			
5	31st passage, batch 2	28	Survived 50 days	
6	1.0 ml., i.p.			
7	31st passage, batch 3	28	Survived 50 days	
8	1.0 ml., i.p.			
9	40th passage	28	Survived 50 days	
10	1.0 ml., i.p.			
11	46th passage	28	Survived 50 days	
12	1.0 ml., i.p.			
13	61st passage	28	Survived 50 days	
14	1.0 ml., i.p.			
15	None	Received same challenge	Died 11 days	Distemper virus infection
16	Controls	dose	Died 12 days	

*i.p.—intraperitoneal.

in a dog in 1941, which has been used ever since for the production of distemper vaccine by the Laidlaw-Dunkin method. The chick-embryo-adapted strain retained its capacity to produce a lethal infection in ferrets through the 24th egg-passage level, but apparently lost its ability to do so between the 24th and 28th egg passage, when it became modified. Ferrets inoculated with the chick-embryo-adapted virus from passage levels higher than the 28th transfer failed to show any signs of illness, but were found immune on challenge with fully virulent, ferret-spleen virus.

A vacuum-dried, live virus vaccine was prepared with the egg-adapted virus from passage levels higher than the 28th. The purpose of this paper is to present the results obtained with the vaccine in the course of experimental immunization of ferrets and puppies, as well as those obtained in the field vaccination of dogs and mink.

Experimental Immunization of Ferrets

Seven batches of vacuum-dried vaccine were prepared from chick embryo tissues infected with the egg-adapted strain of virus of passage levels between the 30th and the 61st. A portion of each batch of vaccine was reconstituted to original volume with sterile distilled water and inoculated intraperitoneally into two distemper-susceptible ferrets, each animal receiving 1 cc. of vaccine, representing 35 mg. of dried embryonic tissues or a 40% suspension, by weight, of infected wet embryonic tissues. All animals survived 28 days without showing any signs of disease and were challenged intraperitoneally with more than 100 m.l.d. of virulent ferret virus. Results of this experiment are summarized in table 1. It can be seen that all vaccinated animals, at all passage levels, survived challenge with a heavy lethal dose of virus, whereas control animals became sick, exhibited typical symptoms of distemper, and died.

In a second experiment, a batch of vaccine, prepared from the 46th passage of the virus in eggs and vacuum dried, was reconstituted to original volume with sterile distilled water. Vaccine dilutions 1:10 and 1:100 were made in sterile broth. Immediately thereafter, each of three distemper-susceptible ferrets received 1 cc. of the reconstituted, undiluted vaccine intraperitoneally, three received an equal amount of the 1:10 dilution, and three were similarly inoculated with the 1:100 dilution. All nine ferrets survived 20 days without any sign of illness. When challenged with 100 m.l.d. virulent ferret virus, they were found to be immune to distemper as shown in table 2. One ferret that received the undiluted material and another vaccinated with the 1:100 dilution, died 20 and 23 days, respectively, following challenge, from Salmonella infection, as determined by laboratory tests. Thus, it was demonstrated that even a dilution of 1:100 of the original vaccine was sufficient to afford a solid protection in ferrets.

TABLE 2. IMMUNIZATION OF FERRETS WITH DRIED VACCINE PREPARATION OF THE 46TH EGG PASSAGE

Ferret No.	Intraperitoneal inoculation 1 cc.	Challenged with 1000 m.l.d. virulent ferret virus— Days after vac.	Result after challenge
1	46th passage		Survived 8 mo.
2	undiluted	20	
3			Died 20 days of Salmonella infection
4			
5	1:10 dilution	20	Survived 8 mo.
6			
7			Died 23 days of Salmonella infection
8	1:100 dilution	20	Survived 8 mo.
9			
10	None	Received same	Died 12 days of distemper infection
11	Controls	challenge dose	Died 13 days of distemper infection

Experimental Immunization of Puppies

In order to demonstrate the antigenicity of the egg-adapted vaccine to dogs, the serum-virus neutralization test in eggs was used. This test is based on the fact that, when grown on the c.a. membrane of a seven-day-old embryo, the egg-adapted strain of distemper virus causes a marked thickening of the membrane. The latter appears moist, and numerous, small, light gray lesions can be seen with the naked eye; these tend to become confluent and form relatively large areas of inflammatory and necrotic tissue. When no virus is present in the inoculum, the c.a. membrane remains typically thin and retains the sparkling transparent appearance of normal membranes with no visible lesions whatsoever. This characteristic of the virus, which causes macroscopically visible changes on the c.a. membrane, has been extensively used in this laboratory as a means of comparing the potency or viability of a given virus preparation with another. It has also been used for the performance of the serum-virus neutralization test which is set up in the following manner:

The test serum is inactivated at 56 C. for 30 minutes. Serial four- or tenfold dilutions are then made in the proper diluent. Each dilution is mixed with a standard virus preparation which, under normal circumstances, causes the appearance of the lesions described above on the c.a. membrane. All serum-virus mixtures are thoroughly shaken and left at room temperature for 1½ hours. Each mixture is then inoculated on the c.a. membrane of at least six embryos. Inoculated eggs are incubated at 97 F. for seven days, then opened and carefully examined for lesions. Absence of lesions is considered proof of the presence of neutralizing antibodies in the test serum. Inversely, presence of lesions indicates the absence of such neutralizing antibodies. As control, a mixture of virus and normal serum is always included with each test and should produce visible lesions.

Four Chow puppies, two to three months of age, were first bled by cardiac puncture. Aliquot parts of their prevaccination serum samples were pooled and the pool was stored at 4 C. Each puppy was then injected subcutaneously with a full dose of egg-adapted virus vaccine, or 2 cc. of the undiluted reconstituted vaccine. Temperatures were taken daily for 15 days. One month following vaccination, the four puppies were all in good condition and growing normally. They were bled, and a second pool was made with aliquot parts of individual sera and stored at 4 C. Each of the pups was then challenged subcutaneously with 2 cc. of a 10% distemper-infected puppy-tissue suspension. Temperatures were again taken daily for 13 days. One month after challenge, all four pups were still in good condition and growing at a normal rate. They were bled and a third serum pool made.

TABLE 3. NEUTRALIZATION IN EGGS OF EGG-ADAPTED STRAIN OF DISTEMPER VIRUS WITH THREE SERUM POOLS FROM FOUR PUPPIES VACCINATED WITH A SINGLE INJECTION OF EGG-ADAPTED VIRUS VACCINE

	Serum dilutions					
Nature of serum pool	1:25	1:100	1:500	1:1000	1:2000	Control mixture 1:25 dilution normal serum
Prevaccination pool	++	+++	+++	+++	+++	+++
Postvaccination pool	–	–	–	±	++	+++
Postchallenge pool	–	–	–	–	++	+++

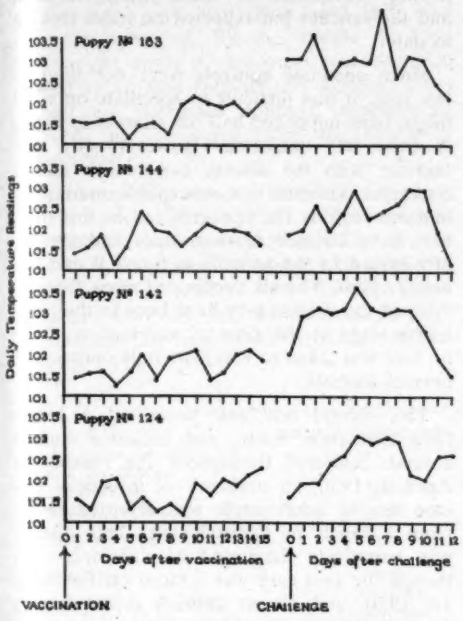
+ Visible growth occurred: absence of neutralization.
— No visible growth occurred: presence of neutralizing antibodies.

A virus neutralization test in eggs was made with all three serum pools and the results are summarized in table 3. It is evident that, although prevaccination serum samples failed to neutralize the virus at as low a dilution as 1:25, both the postvaccination and postchallenge pools did so at an appreciably higher dilution, the difference between the latter being rather insignificant.

Temperatures recorded following vaccination and after challenge are plotted in chart form and given in figure 1. The temperature reaction, following vaccination, was very mild. After challenge, a reaction was observed, but only in one puppy (no. 163) did the temperature go above 104 F., and then only for a short period. Nevertheless, at no time, either after vaccination or following challenge, did any of the four animals present any other noticeable systemic disturbances. They all continued to eat well throughout the entire period.

FIG. 1

Temperature chart of four experimental puppies following vaccination with egg-adapted virus and after challenge with virulent distemper virus.



Immediately after the third bleeding, they were moved to a heavily infected distemper ward. They were observed there for six months, during which time they continued to be normal in appearance.

Field Vaccination of Mink

Due to the limitations of laboratory facilities for extensive experimental work on mink, it was decided to submit the avianized vaccine to field trials conducted in the course of acute distemper outbreaks on mink ranches. It was felt that the avianized vaccine might be of value for the prevention of distemper in mink because of the close relationship of the ferret and mink. Up to this time, the vaccine has been used on four separate ranches after distemper had broken out in the herds. Two field experiences are described here.

The first outbreak occurred on a central New York ranch having a total population of 128 adult mink. The ranch consists of two main sheltered houses, approximately 50 ft. apart, which are identified as A and B. Each has a central aisle running along its main axis and 30 nest boxes are placed on each side of the aisle against the walls of the house. A trap door connects each nest box to an outside wire run. Fifty feet away, to the left of house A, eight cages are located in one row in the open.

At the time of the outbreak, the two houses and the outside cages were filled to capacity—60 mink in each house and eight animals outside. According to the rancher, the first male to be affected with distemper went off feed on February 4, 1950, the second on February 6, and the third on February 9. All these animals had been in house A and were first seen by the authors on February 10. They all presented what are accepted as typical symptoms of distemper and had been removed by the owner to a quarantine section. The owner's good judgment in exercising extreme care by disinfecting himself and all utensils before going from one house to another, no doubt helped prevent the spread of infection.

Among the remainder of the animals in house A, two or three were off feed and presented some swelling of the foot pads and erythema in the anal region. All mink in house B and outside cages appeared normal.

Since house A was the only one affected by February 10, it was decided to treat all animals in this house. In order to compare the relative efficacy of avianized virus vaccine and canine distemper hyperimmune serum, a total of 36 animals in house A were vaccinated subcutaneously with a single dose of 1 cc. avianized virus vaccine, and the 22 remaining mink were injected subcutaneously with 4 cc. hyperimmune serum. In house B, two animals received the vaccine and 19 received serum. The remaining mink in house B were left untreated. The eight outdoor mink received vaccine. Thus, a total of 46 mink received vaccine, 40 were treated with serum, and 39 were left untreated.

A better experimental procedure would have been to leave one-third of the animals of infected house A untreated to serve as controls, but, in consideration of the small numbers of breeders on the ranch, it was felt that it would be unfair to the owner to leave a substantial percentage of his herd unprotected, especially animals that were in such close contact with the infection. This first trial, therefore, should be considered more as a safety trial than one from which to draw any final conclusions regarding the protective value of the vaccine.

While administering the vaccine, animals were purposely treated at random. The three sick animals were immediately disposed of. The pelts were removed and burned. The carcasses were packed in snow and taken to the laboratory where isolation of the virus responsible for the outbreak and the final diag-

nosis of the disease were immediately attempted. In order to determine whether the avianized virus vaccine could protect animals against the particular strain of virus causing distemper on this ranch, it was decided to proceed as follows, using ferrets as experimental animals: Each of two normal distemper-susceptible ferrets was given the same dose of vaccine as that injected into the mink on the ranch. They were observed for four weeks, during which time they remained normal. At this point, two additional ferrets, normal and unvaccinated, were placed with the two vaccinated animals. A 10% suspension of the spleens obtained from the carcasses of the sick mink that had been destroyed was prepared in sterile broth. Each of the above four ferrets was injected intraperitoneally with 2 cc. of the infected spleen suspension. The two unvaccinated ferrets developed distemper symptoms on the ninth and tenth days, respectively, following inoculation, and died on the 17th and 18th days, respectively. The vaccinated ferrets remained normal seven months after inoculation. Thus, the diagnosis of distemper was confirmed and it was shown that the avianized virus was antigenically related to the virulent virus isolated from the outbreak and could protect ferrets against it.

Postvaccination Observations

One month after inoculation of mink on the ranch, all of the animals that had been left untreated in house B, as well as those in houses A and B that had received serum previously, were vaccinated with a single subcutaneous injection of avianized virus. During that month five vaccinated mink from house A had died of distemper or were destroyed when very ill. Similarly, five serum-treated animals, also from house A, had died of the disease. No cases of distemper were reported from house B or from the outside pens. It seems that during the entire outbreak the disease was strictly localized in house A. The excellent management practices of the owner were, no doubt, responsible for the prevention of spread to other animals on the premises.

During the following month, only one additional vaccinated mink died of distemper on April 2, 1950. Thereafter, no more cases appeared on the ranch. The owner reported a normal whelping season. The average litter was equal to, or just below normal. He was, of course, concerned about the fate of the kits which started to arrive shortly after the last death from distemper. Therefore, when the kit population reached the age of six to ten weeks, all of the 263 kits were vaccinated with a single subcutaneous dose of avianized vaccine on July 6, 1950. No reactions occurred following vaccination of these young animals, and the rancher has reported no more trouble to date.

Since adequate controls were not used in this trial, it was difficult to speculate on what might have happened had the animals in house A been left untreated. However, any one familiar with the disease can realize that a distemper outbreak in a susceptible mink population, such as the one involved in this trial, may have claimed more animals and eventually spread to the animals in house B and the outside pens. The six vaccinated mink that developed the disease may have been in the incubative stage at the time of vaccination, since no care was taken to vaccinate only unexposed, normal animals.

The second outbreak permitted a better field evaluation study, and included control animals scattered throughout the ranch. On April 9, 1950, an outbreak of infectious disease among adult mink was reported to us from a ranch in Pennsylvania. This disease was tentatively diagnosed as distemper. Although the first case was noticed on February 14, 1950, and eleven animals died prior to April 9, confirmation of the diagnosis was not attempted until one of the original cases was submitted to the laboratory. A test similar to that described in the first trial was performed with identical results — a virulent distemper virus was recovered, and ferrets previously vaccinated with avianized vaccine survived challenge with a large infective dose of the newly isolated virus. The diagnosis was confirmed a second time, and the same virus type was isolated from three of the unvaccinated control mink which became infected through natural exposure and were sacrificed when moribund.

Exposure of the susceptible mink to the virus was enhanced by distribution of the infected adult males among the females during the breeding season. The movement of exposed males occurred after the appearance of the first case on February 14, 1950, but before mass vaccination was performed on April 12, 1950. On that day, 585 adult male and female mink were vaccinated subcutaneously with a single dose each of 1 cc. avianized vaccine. Seventy-five adult male and female mink were left unvaccinated as controls. These latter animals were scattered throughout the herd in order to assure maximum exposure to the infection. Shortly, thereafter, whelping began

and weaning of the kits was completed by August 10, 1950. As cases of distemper appeared among the control and vaccinated animals, they were placed in the isolation section of the ranch and kept there until they died or were destroyed. By the middle of June 1950, eight cases of distemper had occurred among vaccinated animals and nineteen cases among the untreated controls, representing 1.3% of the vaccinated group and 24.9% of the controls.

For economic reasons, however, the adult nonvaccinated controls (56) which survived one month's exposure following mass vaccination, were vaccinated on May 11. On June 16 and June 30, a total of 709 kits were vaccinated and 140 were left unvaccinated to serve as controls. The latter were vaccinated on August 10, 1950.

Table 4. Vaccination Procedure and Fate of Vaccinated Mink from a Ranch with a Distemper Outbreak

Date of vaccination with 1 cc. avianized vaccine	No. vac.	Status Age	Deaths from distemper following vac.	% survival	Remarks
April 12, 1950	585	Adult	8	98.6	The first symptoms of illness which appeared among the vaccinated animals occurred in two at 10 days, in the others at 13, 17, 30, 43, and 54 days after vaccination.
May 11	56	Adult—surviving controls	0	100	
June 16	326	6 wk.	0	100	
June 30	383	6-7 wk.	0	100	
Aug. 10	140	12 wk.	0	100	
Totals	1,490		8	99.7	

Table 4 describes the vaccination procedure and the fate of the vaccinated animals. It shows that by the end of the outbreak only 0.3% of the total vaccinated animals contracted the disease and died. It is interesting to note that the outbreak was overcome by the time the kits became susceptible to the disease, and not one kit, including the untreated control group, contracted the disease.

On August 28, 1950, two kits vaccinated on June 16 were submitted to the laboratory for challenge. Each received 1 cc. of a 20% spleen suspension intraperitoneally of the original ferret isolation of the distemper strain recovered from this ranch. Two normal ferrets received the same dose of challenge material to serve as controls. The latter showed distemper symptoms on the ninth day and were sacrificed on the 13th day. The two vaccinated kits remained alive and normal until October 3, 1950, when they were returned to the owner.

Field Vaccination of Dogs

Having shown by laboratory trials that avianized distemper virus could be administered to the dog without visible evidence of reaction, trials in a large number of dogs under field conditions were arranged. The purpose of field trials was twofold: to determine if observable reactions occurred, and to determine if clinical distemper would develop in vaccinated dogs after exposure either to clinically ill dogs or in distemper wards.

The adequacy of a field trial is dependent upon the use of a trial product under the greatest variety of field conditions. Some of the factors which vary and may influence the degree of immunity conferred by an immunizing agent may be inherent resistance or susceptibility, age, nutritional state, health of the animal at time of vaccination, and care following vaccination. In addition to these considerations, it was important to use avianized distemper virus, as far as possible, on known distemper-susceptible dogs.

With the cooperation of veterinarians and kennel owners in four states, field vaccination of dogs was initiated. Before any group of dogs was vaccinated, it was determined, as far as possible, that all were normal, and that all pups were weaned, preferably for at least a week. If canine distemper antiserum had been given, vaccination was delayed for two weeks. In a few cases, some other type of distemper vaccine had been administered previously. The dog owners in these cases were advised that a booster effect of the immunity would probably occur.

The vaccination of all dogs in these trials was conducted according to the following plan:

1. The injection site was cleansed with 70% alcohol.

2. Two cc. of reconstituted avianized distemper vaccine were administered subcutaneously posterior to the shoulder in one site. The area was not massaged.

3. Owners were instructed to hold vaccinated animals in regular quarters for two weeks. It was advised that contact with possible distemper-infected dogs be avoided during this period. In some cases, susceptible unvaccinated dogs were held in the same quarters as those just vaccinated with the avianized vaccine. The avianized virus had been shown to be nonpathogenic by ferret to ferret contact.

4. Daily observations were made for a period of two to three weeks, and in some cases it was possible to obtain a daily temperature record. Any symptom such as inactivity, inappetence, diarrhea or constipation, was noted.

5. Wherever possible following the holding period, the dogs vaccinated with avianized vaccine were exposed to clinical cases of distemper or to dogs in distemper-infected wards.

6. A follow-up on vaccinated groups was started two weeks after vaccination and continued until dogs were sold. In many cases it was possible to obtain a follow-up of seven months' duration. All cooperating veterinarians were requested to report any vaccinated animals which developed symptoms, especially those associated with clinical distemper.

The trials were conducted in 24 widely separated kennels. A total of 308 distemper-susceptible and 59 dogs previously vaccinated with some other type of distemper vaccine received a single injection of 2 cc. of the avianized distemper virus. The distemper-susceptible dogs ranged in age from five weeks to five months, the majority being six weeks to four months of age. The previously vaccinated group included animals six months to two years of age. In all, 19 different breeds were vaccinated, including a number of mongrels.

Table 5 gives the results of the distemper-susceptible, vaccinated group. Except for a mild transitory diarrhea in ten dogs, four to ten days after vaccination, no other symptoms were observed. It is pertinent to note that no local tissue reaction occurred, and there were no visible symptoms of reaction during a daily two- to three-week observation period. The disease occurring in the three dogs several days after vaccination was not diagnosed as distemper. The shipping of these dogs seven days after vaccination was earlier than recommended.

TABLE 5. VACCINATION OF DISTEMPER-SUSCEPTIBLE DOGS WITH AVIANIZED DISTEMPER VIRUS

Age wk.	No. vac.	Reactions or subsequent disease	No. exposed to clinical distemper or in distemper wards	Result
5	3	None	0	.....
6-7	68	One shipped 7 days after vac. developed pneumonia	35	1 of 10 exposed to "hardpad," developed "hardpad" and died. All others remained normal.
8-10	77	10 exhibited mild transitory diarrhea 4-10 days after vac. 3 shipped 7 days after vac. developed clinical respiratory infection.	21	Remained normal.
12	76	None	8	Remained normal.
16	60	None	6	Remained normal.
20+	24	None	0	.....
Totals	308		70	

Under close supervision of veterinarians, 70 of the vaccinated dogs were exposed either to dogs with clinical symptoms of distemper or in distemper wards in current use to house distemper-infected dogs. Dogs were exposed in most cases 14 days following vaccination and held for a period of seven to 14 days. The observation following termination of exposure was not less than one month, and, in many cases, follow-up was possible for more than six months.

The significance of the one immunized dog developing hardpad disease cannot be clearly understood at this time. Dogs in this group were ascaris-infected and the nutritional history was unknown.

In table 6, a temperature record of 12 dogs is given as an example of the temperature reactions observed. Some cases showed a mild transitory febrile reaction starting on the

fourth to sixth day; others exhibited no significant deviation from the normal. It is possible that a febrile reaction may have been recorded in these had temperatures been taken twice daily instead of once. It is considered that a febrile reaction, even when mild, is indicative of virus multiplication with subsequent effective immune state.

The previously immunized group of 59 dogs was entirely free from reactions, either systemic or local. No temperatures were taken of the dogs in this group.

Conclusions

A virulent strain of distemper virus was successfully adapted to grow in the developing chick embryo. After 26 serial passages in the chick embryo, its virulence for the ferret was lost, but the modified virus still protected this animal against several hundred lethal doses of the parent strain of virus.

Several hundred ferrets were injected with a vaccine prepared from the modified avianized virus and were proved to be immune to distemper infection upon challenge with fully virulent virus under experimental conditions.

Distemper-susceptible puppies developed substantial titers of neutralizing antibodies following a single injection of avianized virus and showed no visible evidence of disease when challenged with a massive dose of virulent virus.

Most gratifying results were obtained with the avianized vaccine on mink treated after distemper had appeared on the premises. Mass vaccinations stopped the spread of disease, and laboratory evidence was obtained that vaccinated kits became resistant to experimental infection with virulent virus of the homologous type isolated from the premises.

Field immunization of dogs of 19 different breeds, ranging in age from five weeks to two years, has shown the avianized virus vaccine to be safe upon injection, and induces no visible systemic or local reactions. Several of the vaccinated animals were exposed to either clinical distemper cases or in distemper wards without showing any evidence of infection as a result of exposure.

TABLE 6. TEMPERATURE RECORD OF TWO POODLES AND TEN COCKER SPANIELS IMMUNIZED WITH AVIANIZED CANINE DISTEMPER VIRUS VACCINE

Dog no.	Wt. lb.	Age mo.	Days following vaccination 4	5	6	7	8	9	10	11	12	13	14
1	32	4½	102	102	103	101	101	101	101	101	101	101	101
2	28	4½	101	102	102	101	101	101	101	102	101	102	102
3	16	6	101	101	102	101	101	101	101	102	102	102	102
4	19	6	102	101	102	101	101	101	101	101	101	100	101
5	16	4	104	103	102	101	102	101	101	101	102	102	102
6	16	6	102	102	103	102	101	102	102	102	102	102	101
7	26	6	101	101	103	102	101	102	101	101	100	101	101
8	30	6	102	101	102	101	99	100	101	101	101	102	101
9	22	7	102	102	103	102	101	102	102	102	103	102	103
10	12	3	101	103	102	.....	102	.....	102	102	102	101	102
11	8	3	101	103	103	.....	101	.....	101	101	101	101	101
12	7	3	101	103	102	.....	102	.....	101	102	102	102	101

All dogs normal 1 year following vaccination.

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(*Continued on page* 179)

How Public Health Works: Rabies Control

RALPH H. HEEREN,* M.D., Ph.D., M.P.H., and STANLEY L. HENDRICKS,* D.V.M., M.P.H.,
Des Moines, Iowa

A practicing veterinarian** in the southern part of Iowa submitted a dead ferret to the Iowa Veterinary Diagnostic Laboratory for examination for rabies. The laboratory report was positive for Negri bodies and a diagnosis of rabies was made. While the list of domestic and wild animals in which the disease is reported in Iowa is quite extensive, including even ground hogs and badgers, this was the first report of the infection in a ferret. Epidemiological investigation by the Public Health Veterinarian of the Division of Preventable Diseases of the State Department of Health revealed the following facts:

A man with a number of ferrets had appeared in a small, southern Iowa town. He solicited various business establishments to contract for elimination of rats by the use of his ferrets. During his stay in the town, two persons bought ferrets from him. One of the ferrets died three days after purchase. The other animal died 12 days after purchase, and it was this animal that was found to be infected with rabies. It had bitten the new owner and antirabies vaccine was being given. Considering the length of the incubation period for rabies, together with the fact that this animal had not been exposed to other animals subsequent to purchase by the new owner, it was concluded that the animal must have been infected prior to the purchase. No one in the area knew where the man had worked before he came to town nor his intended route of travel for subsequent work. Neither could his final destination be learned. A description of his automobile and the trailer in which the ferrets were transported was obtained. The vehicles bore Kansas license plates but the license numbers were unknown.

The Problem

Here a group of animals, probably infected with rabies, was being transported by truck about the country. The probability of spreading the disease and establishing new foci of rabies infection in Iowa and other states was menacing. How could the owner be located and notified of the danger? How could the animals be found and placed under observation?

Action Taken

The Division of Public Health Education of the State Department of Health, prepared press and radio releases which requested persons knowing the whereabouts of the ferrets or the owner to contact the State Department of Health. Newspapers throughout Iowa carried the story. Since the automobile and trailer bore Kansas license plates, it was believed the man was a Kansan. Because of this, the Kansas State Health Department was notified of this occurrence by the regular reciprocal procedure. In this way it was hoped either to find the man still working in Iowa or to locate him in his home state of Kansas.

The Results

As a result of the press notices the Iowa State Department of Health received information to the effect that the ferret owner had been in several communities in Iowa but no information was obtained that other animal sales had been made. Furthermore, a photograph of the man and some of the ferrets, which had been taken at the time of his appearance in one community, was sent to the State Department of Health.

The Kansas State Health Department took immediate action and by cooperation of the Kansas Motor Vehicle Division, the owner of the ferrets was located in his home county in Kansas. Upon investigation there it was learned that he had returned to Kansas because all of his 33 ferrets died. He was out of business because his "ratters" had been destroyed by a disease which he thought was distemper. He had been bitten and was advised to take the Pasteur treatment immediately. Four dogs, that also had been used in the rat elimination activities, were placed under observation.

This is an example of results obtained by cooperation. Public Health work is a team activity. This problem involved persons and activities ranging from the practicing veterinarian, the diagnostic laboratory, the State Health Department staff, the press and radio of the state, reciprocal notice and response by a neighboring state and the State Highway Patrol, to the final investigation by the local health officer. Another problem might vary in pattern but if it is to be successfully solved it will involve an equally wide range of cooperating groups to form a team.

*Division of Preventable Diseases, Iowa State Department of Health, Des Moines.
**G. H. McNay, D.V.M., Leon, Iowa.

Teschen's Disease In Italy*

DR. BRUNO TESTI, Animal Disease Experiment Station, Rome, Italy

A DISEASE of young pigs with nervous symptomatology similar to that described by foreign authors under the name of Teschen's disease has long been observed in Italy. Pietropaoli[1] first observed it in 1907 in the region of Aquila. At that time, the empirical treatment was application of thermocautery to the head. Since that time, the disease has been found continuously and is more and more on the increase.

In 1948-49, observations made by Menzani[2] and Venturi[3] on a certain number of premises in north Italy made possible a differentiation between this disease and others showing similar symptoms. In effect, Teschen's disease has clinical characteristics which easily can be confused with dumb rabies, the nervous form of hog cholera, Aujesky's disease, the avitaminoses, endoparasitisms, and acidosis.

During our epidemiological observations, transmission studies were made in series in an attempt to reproduce the disease experimentally.

At first, it was supposed that the clinical manifestations were due to avitaminosis. This theory was supported by indications of lack of nutritive substances and absence of proper housing, which resulted in a poor system of swine husbandry.

In the region of Aquila, pigs are imported mostly during January and February, from Perugia. They are placed in dark, humid piggeries where they remain until time for slaughter. Their ration consists of some hay, a little cereal and poor quality garbage. They never receive green forage and the young pigs are deprived of the vitamins which had been provided during the suckling period. It is noted that this vitamin deprivation occurs during the period of greatest growth or, to say, at a time when vitamins are of the greatest necessity.

The vitamin-deficiency hypothesis was confirmed by veterinarians who noted the amelioration which followed administration of cod liver oil or the results obtained following parenteral injections of vitamins A and D_2.

*A translation by Drs. J. P. Scott and A. H. Quin, Jensen-Salsbery Laboratories, Inc., from *Bulletin of the Office International des Epizooties*, Paris, France, Nov.-Dec., 1950.

Editor's Note

Outbreaks of unidentified nervous disorders in swine have been reported by practitioners in widely separated locations in the Corn Belt.

Porcine encephalomyelitis is widespread in Europe, originally referred to there as Teschen's disease, the name taking origin from the community where it was first recognized in Czechoslovakia.

Differential diagnosis is possible by histopathological study of the brain and spinal cord and serological study. Practitioners are encouraged to forward to diagnostic laboratories nervous tissue from animals dying of paralysis, paraplegia or those having shown other symptoms of nervous affliction. Although swine encephalomyelitis (Teschen's disease) has never been identified in the United States, it is not impossible that the virus has passed disease prevention barriers.

For a comprehensive discussion appended by an exhaustive reference list, readers are referred to the article by Martin M. Kaplan and David R. Meranze, Porcine Virus Encephalomyelitis and Its Possible Biological Relationship to Human Poliomyelitis in VETERINARY MEDICINE for August 1948, p. 330.

Continued observations and, more especially, histological examinations of the nervous system showed that the characteristic lesions closely paralleled those described by foreign authors as specific to Teschen's disease. Thus, no doubt remains as to the correct etiology.

One can thus affirm that an enzootic encephalomyelitis of pigs existent in Italy is identical to the disease described by Trefny in Czechoslovakia in 1929. It can be stated that Italian pigs are susceptible up to three months and even to four or five months of age. It seems that adult swine are absolutely refractory. Likewise, the small laboratory animals are nonsusceptible.

According to some authors, there is a relationship between Teschen's disease and the Heine-Medin poliomyelitis of human beings (infantile paralysis). The observations of Venturi contradict this hypothesis. He found that in comparing the incidence of Teschen's disease (30 instances) with Heine-Medin disease (39 instances) there was significant coincidence in only two cases within a short period of time[4].

In Italy, porcine Teschen's disease has not shown any great diffusibility or contagiosity. It is limited to the piggery where it is first manifested without spreading to neighboring piggeries. However, new foci of infection may

develop at a considerable distance, both as to time and location, without the mode of spread or the vector agent being discovered. Sporadic cases are not rare. Morbidity is variable; in one piggery all the pigs may be affected or some of the animals remain normal. It is, frankly, an enzootic disease.

The symptoms observed by Pietropaoli,[1] Menzani[2] and Venturi[3] may be summarized as follows: There are no precursor signs. This disease is usually first observed when feed is placed before the pigs. An animal suddenly presents a cutaneous hyperesthesia, muscle cramps, rigidity of the neck and masseter muscles, trembling of the mandibles, slobbering, strabismus and amourotic blindness.

After a variable period, the pigs develop vertigo; greater excitation; epileptcid seizures; jumping up and down; intense groaning; a staring expression; opisthotonus; spraddling stance or bunching the limbs together, falling to the ground with convulsive respiration and general collapse. These symptoms may last but a short time—perhaps only five minutes—and may not recur. They may also be repeated several times at short intervals. Between seizures the animal appears normal. After several seizures, the pig acquires a deambulation and incoordination of movement (paresis, paraplegia or paralysis). From this time, the pig remains on the ground, unable to get up. Attempts to stand, especially with the hind legs, are futile and the rear limbs are inactive and immobile.

Nervous symptoms worsen still more. The animal remains down and on its side with occasional movements of the front legs; the hind legs remaining immobile. From this stage, it enters into a coma and dies in a comparatively short time, usually within two days. No notable symptoms are observed to involve the urinary, respiratory and circulatory systems although one notes dysorexia, anorexia and occasional vomiting. Temperature remains within physiological limits. The disease may last up to eight days but death may occur during any of the nervous crises.

However, there are some cases in which symptoms of the disease though characteristic are not so well marked. One finds some subjects where the head is turned to one side, there is limping with one forelimb or, where symptoms are more severe, generalized paralysis. One also finds pigs in which symptoms are arrested during the preparalytic stage and, instead of the usual progression of symptoms, there is a slow regression until the animal returns to normal. The clinical symptoms described by our Italian authors do not differ from those cited by foreign workers.

Photo courtesy A. Klobouk.

In less acute infections due to the virus of porcine encephalomyelitis, the hind legs are most frequently involved. Complete flaccid paralysis, as shown above, or less severe paraplegia may occur. In acute infections, death ensues within three or four days.

The study of the epidemiology by itself may suggest the presence of the disease. If one can also make a histopathological examination as well as clinical and epidemiological studies, diagnosis of this disease is facilitated and the biological studies may be omitted. Biological examination of the material is the best method of diagnosis. However, it is not always positive even where the clinical diagnosis is certain. In effect, in certain cases, characteristic histological lesions may be absent. Biological studies can only be done in the pig.

Hog cholera and Aujesky's disease can be confused easily with Teschen's disease. In hog cholera, inflammatory lesions are dominant. These are uniformly found in all of the nervous system. Degenerative lesions are absent and this is especially true of the absence of degeneration of the horns of the lumbar spinal cord. Such degeneration is preponderant in enzootic encephalomyelitis.

In Aujesky's disease, inflammatory and degenerative lesions are found throughout the nervous system. Lymphocytic infiltration of the Ammon's horn and the quadrageminal tubercles are especially specific in Aujesky's disease. The quadrageminal tubercles remain normal in Teschen's disease. This is the principal histological differentiation as described by Menzani[2].

In Aujesky's disease, degenerated cell inclusions are found as described by Weston-Hurst; the nucleus of the cell being fragmented and its chromatin absorbed[3].

In this last clinical form it is possible to effect biological transmission. The rabbit is susceptible to pseudorabies and refractory to Teschen's disease.

Prognosis

Prognosis must be reserved, especially because of the rapidity of the development of the disease and the variety of its manifestations. Cases of spontaneous recovery are frequent and morbidity is often limited to the individual piggery.

Experimental diagnosis can only be made with the pig. Attempts at transmission have been made in Italy with nervous tissue obtained from dead pigs having clinical symptoms and histopathological pictures positive for typical Teschen's disease.

The modes of transmission studied were: endonasal, oral, cerebral and intraocular. The disease was not reproduced by any of these methods. Similar negative results were obtained from Austria (Venturi[3]).

Treatment used is symptomatic. The results obtained have been uncertain so that when recovery occurred it was thought that the cases were benign and the recoveries spontaneous.

It has not been possible to establish or issue prophylactic regulations without knowing more of the specific nature of the disease and its epidemiology.

Attempts have been made many times to develop a satisfactory vaccine, using nerve tissue obtained from affected pigs. Suspensions have been made in saline treated with formaldehyde and held for a time in the incubator at 37 C. The results seem to be good, but the number of animals used in these experimental studies is as yet too small to draw any definite conclusions at this time.

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3. Venturi, *Zooprofilassi*, p. 11, 1948.

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We are indebted to Mr. C. W. Van Beynum, owner of the Willow Farm Kennels, Portland, Conn., and breeder of Welsh Corgis, for providing a small pamphlet entitled The Pembroke Welsh Corgi. This little piece of literature is distinguished not alone by good taste and fine printing, but differs from many distributed to prospective buyers by the expression of sincerity. "We take pride," states the author, "in the rugged health of our dogs and are glad to sell them subject to the approval of the buyer's own Doctor of Veterinary Medicine."

Gut Edema In Swine

An acute and usually fatal disease of swine, named gut edema, has been observed in Illinois. Thirty-four shoats in a drove of 80 were affected; 32 died. The affected animals showed edema of the eyelids and incoordination, followed by convulsions before death.

Postmortem lesions observed included edema of the stomach wall, between the muscular coat and the mucous membrane, along the greater curvature of the stomach. The stomach wall was about an inch thick. The mesentery along the large intestine was also edematous. No pathogenic bacteria were recovered from affected animals.

This outbreak is similar to outbreaks of the disease described in Ireland, England, and more recently in Iowa. Numerous theories as to the cause of the disease have been suggested, but no definite conclusions are yet available.

The true value of the many treatments tried in outbreaks of the disease has not been determined. Individual administration of saline cathartics in the early stages of the disease and feeding a laxative ration may be of some value.

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The Use of an Egg-Adapted Modified Canine Distemper Virus Vaccine Under Experimental Conditions and in the Field

(*Continued from page* 175)

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Preservation Of Hog Cholera Virus At Low Temperatures

C. G. COLE,* D.V.M., and R. R. HENLEY,** B.S., M.S.

UNTIL recently, all of the Bureau's research work involving the use of hog cholera virus has been carried out with phenolized virus stored at refrigerator temperatures. That such virus deteriorates rapidly always has been recognized. Since the potency of a hog cholera vaccine or serum is determined by injecting vaccine-treated or serum-treated pigs with hog cholera virus, the results of a potency test depend not only upon the actual potency of the product but also upon the virulence of the virus and the resistance of the test pigs. Thus there are two variables in each test of an immunizing agent. Control of both would be desirable but control of even one would be advantageous.

The objective of this research, therefore, was to attempt to devise a method of eliminating a variable in producing and testing hog cholera immunizing agents, by providing a virus of standard or known virulence for use in challenging the immunity of vaccinated pigs.

The need of a standard or reference virus became particularly desirable in the course of experimental work connected with the development and study of crystal-violet vaccines. The immunity of pigs treated with successive lots of vaccine could not be challenged with the same virus because the viruses lost virulence or deteriorated on standing or storage. There was, therefore, the possibility that differences in results obtained between successive tests at even short intervals were due to changes occurring in the virus in the interval between tests. Differences also could be due, as pointed out above, to variations in resistance in the pigs used in the several tests.

It was considered possible to eliminate the differences due to different viruses by preparing a large lot of virus and holding it under conditions in which no change would take place over a long period. That hog cholera virus can be maintained unchanged for years by desiccation from the frozen state is well known. However, in this work, desiccation of large lots could not be carried out because of the lack of suitable equipment. Also, it is well known that, in general, viruses stored at the temperature of dry ice remain unchanged for long periods. Investigations of the effect of storage in dry ice on hog cholera virus were begun but the cost of dry ice proved excessive. The possibility of using mechanical refrigeration was therefore considered. A box in which a temperature of —40 F. could be maintained was purchased at a reasonable price and has been used in the investigation described in this paper.

*Veterinarian, **Biochemist, Pathological Division, Bureau of Animal Industry, Agricultural Research Administration, U. S. Department of Agriculture.

General Plan

The general plan of the work was to titrate a defibrinated blood virus as soon as possible after it was drawn. The titration was carried out on susceptible pigs in the manner previously described†.

The virus was then divided into two portions, the larger of which was phenolized. A subportion of the phenolized virus was placed in a refrigerator and held at temperature between 32 and 50 F., a second subportion was placed in the freezing compartment of an electric household-type refrigerator and held at a temperature of 20 to 25 F. A third subportion of the phenolized portion and the portion left unphenolized were placed in the low temperature box and held at —40 F. At intervals of 150 days or longer, a part of each subportion was thawed and the virus titrated.

Although as already indicated, the investigation was planned primarily to find a method of preparing a virus of standard or known virulence for use in challenging the immunity of vaccinated pigs, it seemed well worth while to determine whether prolonged storage affected the antigenic properties of virus. Therefore, investigations of the antigenic value of virus stored at low temperatures were carried out as follows:

A phenolized subportion that had been held at —40 F. for 150 days or more was thawed, placed in the electric refrigerator and held 60 days or more. It was then tested for antigenic

†*Jour. Am. Vet. Med. Assn.*, 108:143 (Mar.), 1946.

value by injecting it, along with appropriate doses of serum, into susceptible pigs which were held 90 days or longer and their immunity then challenged by injecting them with virus. Two sets of controls were used, one of which consisted of untreated pigs and the other of pigs that had been treated with serum alone at the time the test pigs were treated with serum and virus. The untreated and serum-alone-treated controls were exposed by virus injection at the same time the immunity of the serum-virus-treated pigs was challenged.

The results of titration after storage are shown in table 1 and the results of the tests of the antigenic properties of the viruses after prolonged storage, first at —40 F. and later after being held at 32 F. or above, are shown in table 2.

Discussion of Titration Results

In titrations to determine the minimum lethal dose of a virus, inconsistencies between the results obtained with different doses of a series are at times observed. Such inconsistencies were occasionally obtained in the titrations of the viruses used in the work reported in this paper. However, results, on the whole, were very consistent, the inconsistencies being far too few to affect the conclusions reached regarding the minimum doses required to produce cholera.

Phenolized simultaneous viruses are held at refrigerator temperature. They are marketed under a 90-day expiration date because, as previously stated, such viruses lose virulence. All such viruses in this series of experiments showed reduced virulence. As an example, one virus when first prepared produced disease in doses of from 1 cc. down to 1/5,000,000 cc., but after storage for 226 days at refrigerator temperature it produced disease in 1 cc. doses only.

Results of tests of the frozen phenolized subportions held at 20 to 25 F. closely paralleled results obtained with their unfrozen counterparts held at temperatures slightly above freezing. Therefore, no real difference was detected in the rate of loss of virulence between the phenolized subportions held at 20 to 25 F. and those held at 32 to 50 F. When this observation was made, tests of the subportions held at 20 to 25 F. were stopped.

TABLE 1. RESULTS OF VIRULENCE TEST OF VIRUSES STORED AT DIFFERENT TEMPERATURES FOR PROLONGED PERIODS

Virus no.	Smallest dose of the freshly prepared virus that produced cholera cc.	Days stored	Smallest dose, after storage[1] that produced cholera in— Phenolized portions held at— 32 to 50 F.[2] cc.	20 to 25 F.[2] cc.	—40 F. cc.	Unphenolized portion held at— —40 F. cc.
257	1/100,000[4]	222	1	1	1/100,000[4,5]	1/100,000[4]
		405	1[4]	1[4]	1/100,000[4]	1/100,000[4]
258	1/100,000[4]	191	1/100,000[4,6]	1/10,000[5]	1/100,000[4]	1/100,000[4]
259	1/100,000[4]	197	1/10,000[5]	1/10,000	1/100,000[4]	1/100,000[4]
260	1/10,000	155	1	1	1/100,000[4,5]	1/100,000[4,5]
		425	0[7]	0[7]	1/10,000	1/100,000[4,5]
262	1/100,000[4]	160	1	1/10,000[5]	1/100,000[4]	1/100,000[4]
263	1/100,000[4]	191	1/10,000	1	1/100,000[4]	1/100,000[4]
267	1/500,000[4]	155	1/10,000	Not tested	1/500,000	1/1,000,000[4]
268	1/500,000	174	1	Not tested	1/100,000	1/100,000
274	1/1,000,000	239	1	Not tested	1/100,000	1/1,000,000[4]
276	1/5,000,000[4]	226	1	Not tested	1/1,000,000	1/5,000,000[4,8]
		331	2[4]	Not tested	1/1,000,000[4]	Not tested

[1]Two pigs were used for each dose in all tests. Cholera was considered produced if a pig developed acute cholera. With few exceptions, such pigs died. All pigs that remained normal after a first virus injection were later tested for susceptibility and with one exception were found to be susceptible.

[2]Some of the portions were held in an icebox, others in an electric refrigerator.

[3]Held in the freezing compartment of an electric refrigerator.

[4]Smallest dose tested.

[5]One pig remained normal, the other developed cholera.

[6]In this test both pigs receiving 1/10,000 cc. and one receiving 1/100,000 cc. remained normal, and the other pig receiving 1/100,000 cc. developed cholera. Two pigs receiving a 1 cc. dose died.

[7]One cc. doses were used and pigs remained normal.

[8]One pig that received 1/1,000,000 cc. and one that received 1/5,000,000 cc. remained normal.

The results with the subportions held at 20 to 25 F. indicated that storage at that temperature would not preserve virus with unimpaired virulence.

On the other hand, the phenolized and unphenolized portions stored for 155 to 425 days at —40 F. retained practically all of their original virulence. In some instances, the unphenolized portions showed somewhat less loss of virulence than the phenolized portions. The difference, however, was not sufficient to lower materially the efficiency of the phenolized viruses. Hog cholera was produced by doses of 1/100,000 cc. or less in all except one of the 13 tests of ten phenolized viruses held at —40 F. Samples of these frozen viruses are to be retested to determine if and when virulence is lowered to a degree that would render them unsuitable for practical use. Results already obtained indicate that, with few exceptions, no loss of virulence was found in viruses stored at —40 F. for periods up to 425 days.

TABLE 2. RESULTS OF IMMUNITY TESTS OF PIGS TREATED WITH SERUM AND PHENOLIZED VIRUS THAT HAD BEEN HELD AT —40 F. FOR LONG PERIODS, THEN THAWED AND HELD AT 32 TO 50 F. FOR MORE THAN 60 DAYS

Virus no.	Days stored at —40 F.	Days that the thawed product was held at 32 to 50 F.	M.L.D. when used[1] cc.	No. pigs	Treatment used[2] Virus dose cc.	Serum dose cc.	Number of pigs found protected by virus injection about 90 days after treatment
257	222	65	1/100,000[3]	3	1	35	All
				3	0	35	None
				2	0	0	None
257	410	65	1/100,000[3]	4	2	35	All
				2	0	35	None
				2	0	0	None
258	191	73	1/10,000	4	2	35	All
				2	0	35	None
				2	0	0	None
259	226	75	1/10,000	4	2	35	All
				2	0	35	None
				2	0	0	None
260	155	67	1	4	2	35	All
				2	0	35	None
				2	0	0	None
262	160	76	1	4	2	35	All
				2	0	35	None
				2	0	0	None
263	191	61	1/10,000	4	2	35	All
				2	0	35	None
				2	0	0	None
267	155	84	1/10,000[3]	4	2	35	All
				2	0	35	None
				2	0	0	None
268	362	65	1	4	2	35	All
				3	0	35	None[4]
				3	0	0	None
274	154	65	1	4	2	35	All
				3	0	35	Pigs used in test of 268 are controls for 274
				3	0	0	Pigs used in test of 268 are controls for 274
276	226	105	2[3]	4	2	35	All
				2	0	35	None
				2	0	0	None

[1]Smallest dose that produced cholera.

[2]In the above 11 tests the pigs that received no serum or virus were controls and were exposed at the time the treated pigs were exposed by a virus injection.

[3]Smaller doses were not used.

[4]All pigs in this test either died or were killed except one which was sick but recovered.

Since a virus held at —40 F. will retain its virulence over a long period and thus is suitable as a standard virus for challenging immunity, the variable of differences in virus is practically eliminated. Another variable, the differences in pigs, has been partially controlled in testing vaccines by using a control vaccine. That is, when a vaccine is tested against a standard virus on a new lot of pigs, a previously tested vaccine is retested at the same time with pigs from the same lot.

Discussion of Tests of Antigenicity of Stored Viruses

The results of the tests of antigenicity of viruses stored first at —40 F. for 155 or more days, then thawed and held at 32 to 50 F. for more than 60 days, were uniform. Ten such viruses were used; one was tested twice. Storage at —40 F. was between 155 and 410 days. After thawing, the viruses were held from 61 to 105 days before testing for antigenicity.

In each of the 11 tests, the pigs treated with the experimental virus and 35 cc. of a commercial serum remained normal when exposed to cholera by virus injection about 90 days after treatment. In each instance, the control pigs developed cholera. There were two groups of controls, the first untreated, and the second treated with 35 cc. of serum alone at the time the serum-virus pigs were treated. The results, therefore, clearly indicated that the viruses retained their immunizing powers and antigenicity even after prolonged storage at —40 F. followed by more than 60 days of storage at refrigerator temperatures.

Summary

Ten different hog cholera viruses were titrated for virulence in doses ranging from 1 cc. down to 1/5,000,000 cc. when first prepared. They were then divided into subportions, some of which were phenolized. The subportions were held at different temperatures for periods up to 425 days. They were then titrated, usually in the same doses employed originally. Some of the phenolized portions, after storage at —40 F. for long periods, were thawed and held at temperatures of 32 to 50 F. for from 61 to 105 days, then tested for antigenic properties when used with hog cholera antiserum.

Loss of virulence was detected in the phenolized viruses stored at temperatures slightly above and slightly below 32 F.

With few exceptions, no loss of virulence was detected in phenolized and unphenolized viruses stored at —40 F. for periods up to 425 days.

Phenolized viruses stored at —40 F. for periods up to 425 days, then thawed and held at ordinary refrigerator temperatures for 61 to 105 days, produced lasting immunity when used with hog cholera antiserum in the simultaneous method of immunizations.

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Government Processing Order On Cattle

Slaughterers of cattle have been ordered by the Office of Price Stabilization (OPS) to process no more cattle in April this year than in April 1950, disregarding numbers that may be available at markets. Cattle only are affected by the order.

The reason given for delay in plans of slaughter control is that administrative organizations have not been set up. In February, slaughterers were ordered to register by March 15, but this deadline was advanced to April 15, because of lack of registration forms. A slaughterer of cattle cannot operate after April 15, according to the OPS, unless registered.

Considering the increased number of slaughter classes of cattle on the range and in feed lots over the number available at this time one year ago, it might be reasonable to expect the price of a steak to come down a bit. This hopefulness, however, does not take into consideration effect of bureaucratic meddling in the marketing and slaughter of livestock.

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Fortenberry (*I.S.C. Vet.*, 13:85 [2], 1951) states that "controlled breeding of normal swine has definitely established itself in the industry and is both practical and economical."

Equine gonadotropin (PMS), obtained from the serum of pregnant mares, has given growers of swine most consistent results. This hormone contains both the follicle-stimulating and luteinizing fractions. Recommended use is the subcutaneous or intramuscular injection of 10 cc. (500 rat units). Estrus is induced within three to five days, and ovaries stimulated to multiple follicle production. Such "flush" is said to result in increased litter size.

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When 0.6 gm. of aureomycin was fed daily to steers, it produced a marked anorexia and a fetid diarrhea within 48 to 72 hours.—*C. K. Whitehair, D.V.M.*

Effects of Inhalation of Chlordane Vapors upon Pigeons

W. J. NICKERSON,* D.V.M., and R. D. RADELEFF,* D.V.M., Kerrville, Texas

Chlordane is used for the control of insects, ticks, mites, and spiders inhabiting buildings. When employed for controlling these pests, it is generally used as a 2% solution applied as a surface spray at the rate of approximately 1 gallon for each 750 square feet of surface. This results in a deposit of about 100 to 125 mg. of chlordane per square foot of surface area. When deposited on the surfaces, the chlordane slowly volatilizes over a period of several weeks. The question has been raised whether such chlordane vapors might prove harmful to warm-blooded animals, including man. Lehman[1] has reported apparent toxic effects on pigeons following use of chlordane in a small room housing the pigeons.

In view of the use of chlordane by poultrymen for controlling insects and other poultry parasites and the possibility that poultry might be sensitive to vapors of chlordane, special studies were undertaken as reported in this paper and in a companion paper by the authors, entitled, Effects of Inhalation of Chlordane Vapors Upon Young Poultry.

This experiment was initiated to determine the effects upon pigeons of prolonged inhalation of vapors arising from chlordane used as a residual premises insecticide.

Animals and Materials Used

Adult pigeons were used for all work. There was some obvious variation in ages and this was considered in pairing them. The birds were purchased on the statement that they had had no previous exposure to insecticides. All were in excellent physical condition.

Three wire-mesh cages, 23 x 20 x 15 inches, were fitted with plywood cover boxes just large enough not to contact the sides and top of the cages.

The front and back of these cover boxes were provided with openings equivalent to 4% of the interior surface area of the cover. Each cover box presented an interior surface of 2,049.1 square inches, of which 82.5 square inches were the openings for ventilation.

The cages, with cover boxes in position, were placed on a solid platform inside a 10 x 10 foot shed-roof poultry house similar to that described in Bulletin 65 of the A. & M. College of Texas.

The interior surfaces of the top and four sides of two cover boxes were treated by brush application with 5% solution of chlordane† in deodorized kerosene to yield a final deposit of 1,000 mg. of chlordane per square foot. The third cover, designated as the control, was treated with plain kerosene at the same rate as was used to treat the other two covers. Each cover box contained 1,966.6 square inches of treated surface.

Experimental Methods. One young and one old adult pigeon were placed in each cage and the cover boxes put in place as soon as the surfaces of the boxes were dry.

Except for necessary cleaning of the cages and feeding of the pigeons, the covers were kept on the cages continuously for 60 days.

Thirty-one days after the first treatment the cover boxes were cleaned with acetone and a second application of chlordane at the same rate was made, using acetone as the solvent instead of kerosene.

Food for the pigeons consisted of whole milo, cut yellow corn and wheat, green vegetables, and water.

Results. This experiment was conducted during October, November, and December 1950. The lowest temperature during the period was 13 F., the highest 92 F. and the mean 55 F.

No ill effects of the 60-day exposure were noted. On the 60th day of exposure one pigeon from each cage was killed and subjected to a detailed autopsy. No lesions were observed.

Histopathological studies revealed no lesions attributable to chlordane.

Conclusions

Under the conditions of this experiment, no ill effect was observed in pigeons continuously exposed for 60 days to the vapors arising from surfaces treated with chlordane at the rate of 1,000 mg. per square foot.

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*U. S. Department of Agriculture, Agriculture Research Administration, Bureau of Animal Industry.

†Technical chlordane equivalent to 60% octachloro-4,7-methanotetrahydroindane and 40% related compounds was used in the experiment.

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Synnematin, a new antibiotic reported by Gattshall, *et al.* (*Proc. Soc. Exp. Biol. & Med.*, 76:307 [Feb.], 1951), is said to demonstrate exceptional activity against Salmonella species. *In vitro* and *in vivo* activity in laboratory animals indicates other favorable properties.

The Psychology Of Client Relations*

KENNETH B. HAAS, Sr., B.S., M.A., Ed.D., Loyola University, Chicago, Illinois

BEGINNING with Lucretius, Galen and Hippocrates, and down to Osler, Banting and Theobald Smith, the genuine medical man who refused to mutter a magic formula as he prepared his medications and instruments, found himself replaced by an adaptable charlatan.

It is suspected that you will critically examine some of the suggestions which will be made in this presentation—that some of you may even think that quackery is being presented. However, you men in veterinary medicine deal with human beings as well as with animals. In fact, there is often a question in your minds as to whom you are treating—the human being or the animal! It has been said that at least 50% of your efforts are spent in managing people and there is ample evidence to support that statement.

Therefore, many of the laws of psychology have a large place in both small and large animal practice. Psychology as a science, is not as old, nor as venerated as veterinary medicine, although as an art, it has been practiced since the beginning of time. During the past 50 years psychology has become one of the sciences. And the most hopeful aspect in psychology, as in veterinary medicine, is the victory of the experimental method over the assumptions of mere "authority." Therefore, you need not believe anything you may be told here; you need only believe what is to be demonstrated to you.

A job specification for doctors of veterinary medicine can be secured by writing to Washington. This is an occupational summary. It thoroughly describes the technical information, skills and knowledge that must be the possession of all licensed practitioners. But it says nothing about dealing with the psychological aspects of client relationships. Nothing is said about the psychology of color, the psychology of hospital structure and appearance, how to deal with client moods and temperaments, how to maintain and develop personal relationships with fellow practitioners, citizens, allied, related or supplementary professions such as humane societies, allied medical men, the half-educated person, children and drunks, uninformed personnel, the hypochondriac, and the emotionally unbalanced individual. You know that these relationships are of equal importance with technical skills.

*An address delivered at the Illinois State Veterinary Medical Association, Chicago, Jan. 30, 1951.

The Author

Doctor Haas, an outstanding authority on psychology, is chairman, Department of Marketing, Loyola University, Chicago.

He has served as special lecturer on human behavior at the University of Pittsburgh, New York University, City College of New York, and Ohio State University. His keen insight into relationships between veterinarians and the character patterns of animal owners has evolved from special interest and study. Doctor Haas has one son, a practicing veterinarian in Chicago, and another studying for a veterinary degree.

Personal Appearance

The psychology of client relations begins with appearance of both the practitioner and the hospital or office. Consideration of personal appearance is a show of respect to those with whom you may have business relations. A clean, neat appearance suggests habits of care and attention to detail. With care in speech and an attitude befitting a professional man, favorable impressions are given clients.

The Appearance of the Hospital or Office

Conservative figures, based on years of research, indicate that a good front brings in over 25% of hospital or office calls. Many controlled experiments have revealed that windows should be constructed flush with the sidewalk and should be unpainted except for the name of the hospital or the director.

The interior view should reveal a unit; much of the hospital should be in full view from the front of the walk, except for cages, stalls and storerooms. The operating room probably should be walled high enough to obstruct the view of an operation; with only the upper part of the practitioner's body in the range of vision of clients.

The Influence of Color on Client Relations

Since color is purely visual, the importance of it in an office, or hospital, or outside practice, cannot be overemphasized. Some authorities even name it the most important element for influencing human relations. Color involves a strong personal feeling; a color you like, may annoy another individual. A color like rust, for example, very often has an unpleasant connotation, while an unrelieved black is extremely depressing.

In 1800, Dr. J. W. Ritter first experimented with colors and discovered that some are compelling while others arouse antagonism. He found that one-half of the spectrum (blue) was definitely receding. The other half (red) was advancing. A little later, at the Psychiatric Neurological Clinic in Vienna, Doctor Ehrenwald verified the same conclusions. All subsequent experiments with color have proved that red has a pulling power while blue has not. The increased use of the red spectrum has been tremendous. It is the one color (in various shades, of course) that can be found in every establishment that deals with clients (or customers), although it is combined with white, smoky white, or ecru.

The Influence of Light on Client Relations

One of the physical characteristics of the eye, as far as reaction to color is concerned, is that white or light objects have a tendency to look larger than dark or greyed objects. The white reflects more light, while dark absorbs it. Professor McCardles of Yale University says, "Light as it appears to the individual seems to be accepted as one of the mysteries of nature. The scientist has solved many of the age-old secrets and put them to use in the service of mankind. But the manner in which light appeals to the individual, beyond giving a sense of visibility, is still an undeveloped subject. In as much as vision still deals directly with characteristics of the eye, the physiological and psychological offer assistance."

While visibility is the foremost purpose of lighting, we must consider it not in terms of quantity and quality, but from the viewpoint of ease of seeing.

The entire interior of your reception room and office is, or should be, on display and the lighting of them is important. Good lighting stimulates more favorable response; light attracts more attention. The type of lighting depends on the job to be done by it. It may be incandescent, fluorescent, arc, or mercury vapor; perhaps kerosene, airlamp, candle or gas. All have their place in veterinary practice.

The Psychology of Human Relations

Desire to be liked. Every one of us, if we are honest with ourselves, wants to be popular and well liked by our clients, our friends, our employees, our associates, and our families. This desire to have people like us and to say good things about us is one of the most common and powerful of all human motives.

We want to be popular and well liked, because it makes our job so much more pleasant, helps us to be more successful, makes our social and professional life a happy one.

The trouble is that there is a big gap between wanting to be liked by other people and actually being liked. Very few of us have any definite ideas or planned program for selling other people on the idea of liking us. Most of us believe that we are born with certain characteristics and a certain personality, and for better or for worse we are stuck with it the rest of our lives.

Nothing could be farther from the truth. We can, starting today, take some simple and easy steps which, if we are willing, can greatly help us to sell our ideas to our clients, our professional associates, our employees, even our own families.

Human relationship is not entirely a new idea, although it may be presented in a new way. These suggestions offer you a simple and enjoyable way to improve your own ability to convey your ideas, knowledge and skills to other people, and in improving your abilities to communicate, solve some of the problems all of us have to face when we deal with other people.

Why some people fail to reach the heights. Before telling you about it, I want to take a moment to explain why some of us fail to reach the heights of professional business, social and domestic success. First, all of us have a tendency to criticize the other fellow. Maybe we will not admit that, but admit it or not, it is a temptation which is hard to resist. Second, all of us are inclined to be backward in looking for the good in other people. Obviously, we have friends we greatly like and admire, but I am speaking now not of the friends we enjoy, but of the people we contact in our daily lives, our business associates, our clients, our employees, and even our neighbors.

As human beings we unfortunately are only too willing to speak out when it comes to criticism, but we are backward most of the time when it comes to paying compliments to others, Paying compliments is the key to influencing people, the core of all good client relationships.

Dealing with client behavior. Now let us consider some of the specific moods, temperaments, attitudes and behavior patterns of various individual clients. When we analyze client behavior we must beware of typing. People are not susceptible to typing. They may, however, be studied in relation to behavior. Clients are minds and emotions, not people or things.

BEHAVIOR PATTERNS*

Timid

Those persons classified as timid are also shy, bashful and often sensitive creatures. Fear and caution are predominating in their natures.

Be helpful and reassuring. Give the "timid soul" time to become adjusted to the surroundings. Explain carefully.

Suspicious

A suspicious person is also a sentimentalist. He is at once distrustful, cautious, unbelieving, doubting and non-cooperative. Examples of the suspicious are to be found among dog lovers. They are hurt-conscious.

Gain the confidence of your suspicious client by being straightforward. Demonstrate and agree with his objections. Explain clearly and convincingly and at the same time invite him to assist you.

Silent

Individuals classified as silent types have little to say to the point of being indifferent. The interests of these are directed inwardly (introvert), rather than to external things or problems.

Gain this fellow's confidence by expressing confidence and knowledge of the solution to the problem presented. Work for agreement on minor points, watch for agreement signals. Be honest, tactful and straightforward.

Irresponsible

One meets, aside from irresponsible children, adults of a similar nature, represented by examples among politicians, city officials, police and service men. Drunks and demented are certainly irresponsible.

Usher them out promptly. Be swift, decisive, but cajole and compliment, and collect your fee.

*Caricatures of human behavior patterns by the author.

Decisive

These persons are confident, positive, conclusive and opinionated. They are found among physicians, dentists, professional men, and those whose business operations are classified as large.

Exercise self-control in dealing with these. Be tactful and brief. Get client's opinion on all important points and use medical terminology in referring to the patient or the pathology exhibited. Show and demonstrate tentative plans for treatment.

Deliberate

Characteristically slow and cautious. This man believes he knows the veterinarian's job. He weighs values and is self-possessed. This behavior pattern is found among physicians, dentists, professional persons, and stock owners.

Take plenty of time with those who are deliberate. Give opportunity to "think it over." Cover points slowly and in minute detail. Be patient and cautious. Use full medical terminology and show by demonstration the proposed course of action.

Do people judge a doctor by whether or not he is a good listener? "In his history taking," says *New York Medicine*, "a doctor finds the patient eager to relate symptoms with exhausting attention to detail and trivia. It is understandable why doctors become impatient with their clients, but becoming impatient and showing impatience are vastly different things. Our graces may be many, our ideals high, our errors not too many; but we must learn that much of the art of medicine resolves itself into the art of listening."

Arguer

Some, whose nature is characterized by inflexibility and obstinacy, argue. They are opinionated, contrary and generally have nasty dispositions.

It is advisable always to get and hold the lead. Demonstrate and dramatize your service. Listen patiently if necessary. Be firm and positive in all relations with the arguer.

Impulsive

These persons are impatient and act on impulse. They tend to nervousness, are quick in speech, and are apt to be excitable or actually unstable.

Quick action is recommended in handling the impulsive type. Hit the high spots and avoid debate or an argument. Move rapidly to complete the transaction.

This character puts off action. He is usually affable and willing to listen. His manner is hesitating. Many such indecisive persons are hypochondriacs.

Give positive suggestions and offers to help by assisting such clients to make a decision. Be tactful.

Indecisive

The Ideal

The great majority of those whom we serve as veterinarians are friendly and pleasant. These are usually well educated, versed in many topics and reasonable and attentive. They are extroverted.

Treat them the way you would like to be treated.

The inflexible, obstinate, half-educated, opinionated individual may be classified under behavior patterns as stubborn or contrary. Persons from the nursing profession, pharmacists, masseurs and some breeders groups supply examples of the type.

Let such a person talk. Be patient and suggest opposite action. Let him decide. Show and demonstrate your technic, using some professional terminology. Work rapidly to complete the consultation.

Stubborn

The Power of Compliments

Let us once more consider the topic of compliments. Compliments are considered honest statements about virtues which really exist.

Compliment people by speaking to them on their own level. If the person is a physician, talk about blood counts, urinalysis, etc. Talk to the farmer or the day laborer on his respective level. Tell him something about himself, his family, his possessions, his animals that will please him and that is truthful.

Next?

Wives of veterinarians can do much to build a clientele through proper use of the telephone and proper handling but should not hit clients with their "halos." They can develop social contacts, telephone skills, reception skills, sympathy, and understanding.

All human beings are pretty much alike if they are normal. We can be sure that nearly

everyone will react favorably to a compliment. We must make the paying of compliments a habit. "Toot the other fellow's horn."

We must be very careful to differentiate between compliments and flattery. Flattery inflates the ego, but has little basis in truth; so only the naive and gullible are impressed. Whereas, compliments are considered honest statements of praise about virtues that really exist.

No Idle Silences

Never be guilty of a negative attitude toward clients. Train yourself automatically to look for the good in others and when you see it be sure to say it, or indicate in other ways that you know and appreciate the words, actions or achievements of others. Never hunt trouble.

The words you speak and the things you do today form the reputation you have tomorrow.

Give your clients something to take home with them; a card or booklet, for example.

Call up and ask how the animal is doing; don't wait for the owner to call.

It is easy to have people say good things about you when you speak well of them.

Compliments may also be non-verbal. Let clients handle equipment. Demonstrate a technic. Show them instruments on display.

Abraham Lincoln said, "The best way to destroy your enemy is to make him your friend."

When dealing with county agents, humane society representatives, sanitation men; make them your friends. If they respond, fine. If they don't, fight them.

Conclusion

In the marketing field, the factors that have been discussed are variously named salesmanship, merchandising, showmanship, human relations, customer relations, public relations, etc.

I have studied veterinary ethics and practices for more than ten years, until I have approached confusion studying the conflict of ideas (ethics), and I have slowly come to believe that veterinarians could employ, without ethical compromise, more and better salesmanship, more and better client relations, more and better showmanship, in their professional skills and in human relationships.

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Plan to attend the A.V.M.A. convention in Milwaukee, August 20-23, 1951.

New Poultry Disease Laboratory

The state of California has purchased 2.21 acres of land about one-quarter mile south of the city of Petaluma on U. S. Highway 101 as the site for the Petaluma Livestock and Poultry Disease Laboratory to be built and equipped at a cost of about $250,000.

The construction of the new laboratory is a part of a correlated program for the expansion of the state's livestock and disease laboratory services directed by the Division of Animal Industry, California Department of Agriculture.

The correlated program has already provided for the construction of a new laboratory at San Gabriel, another new laboratory in course of construction at Fresno, the Petaluma laboratory and a laboratory for Sacramento in the future.

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Formston, of the Royal Veterinary College in England, advocates the emasculation of male colts, when they are only six to 14 weeks of age, rather than waiting until they are yearlings or two-year-olds. At this youthful age, he anesthetizes them easily in the standing position with a dram of chloroform on a cotton pledget in a mask, allowing only limited air. In six minutes, they go down and are then restrained by mechanical means. The surgery is careful, though it differs from the usual method employed here, in that the vascular cord is ligated with chromic catgut, and the skin incision is closed with the same suture material. This humane surgery, the careful technic, and the ease of handling; minimizing shock, and hastening healing without complications, are worthy of emulation everywhere.

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Practitioners report an increasing frequency in the occurrence of histoplasmosis in their canine patients. The disease is ascribed to a yeast-like organism, *Histoplasma capsulatum*. Autopsies indicate an enlargement of either the mesenteric lymph nodes alone, in this form cachexia, inappetence and ascites are general clinical symptoms, and a more generalized condition in which, in addition to hypertrophy of lymph nodes, enlargement of the spleen and liver are observed. Sometimes lung nodules are found. Marasmus, icterus and vomiting usually precede death, though it is not always a fatal disease. There is some evidence that the disease may be intercommunicable between man and animals.

Streptococcic Septicemia In Mink Kits

G. R. HARTSOUGH, D.V.M., New Holstein, Wisconsin

STREPTOCOCCIC septicemia in mink is a disease largely of the young, caused by a streptococcus and characterized by sudden mortalities and a low morbidity.

So far as is known, the disease has not hitherto been distinguished as a separate and distinct entity. The condition is widespread and has undoubtedly occurred for many years. Since 1946, it has been recognized as a distinct and separate disease of young mink. Many times a different picture of disease problems in mink is obtained when one has the opportunity of examining every mortality that occurs on a large ranch. This is especially true when thousands of animals are involved. This is in contrast to examining only those mortalities the rancher cares to submit to a diagnostic laboratory for examination. He tends not to submit the occasional loss, especially in young animals.

While definite experience with the disease has been limited to the north central states, there is no reason to assume that it does not occur in other areas. Mink kits are most susceptible and the first cases are usually detected when they are from five to six weeks of age. New cases continue to be discovered until late summer, reaching a peak in July and August.

*The classification of the organism was accomplished through the courtesy of the Army Medical Department Research and Graduate School at Washington, D.C.

Generalized streptococci infections are found occasionally even in the adults.

Etiology

The cause of the disease is a beta hemolytic streptococci of Lancefield's Group C*. The organism can be isolated in pure culture from most of the visceral organs. Streptococci of this type are common animal pathogens and have been isolated from most of the farm animals.

It has not been determined if the disease is a food-borne infection or if adult mink act as carriers. Behavior of the infection in litters indicates that it may be passed directly from one kit to another when they are in direct contact. This condition exists before they have been separated into individual pens.

In recently dead animals, the Streptococcus is invariably isolated in pure culture from the heart, liver, spleen and kidneys.

Symptoms

The first cases are discovered at about the time the kits begin to come out to the feed board and start eating of their own accord. Oftentimes the first indication that something may be wrong is the discovery of a dead kit in the nest box. The feed consumption is not lessened enough by the loss of one animal in a litter to arouse the suspicion of the feeder that something may be wrong. So the discovery of the loss is by accident.

It is common to find the first loss followed in three or four days by the loss of another kit in the same litter. A few days later, another of the same group may be lost. This often continues until the entire litter has succumbed. On the other hand, it may take only one animal.

There is nothing much distinctive about the symptoms revealed by an infected mink kit. It may appear less active, dull, refuse food, and exhibit general lassitude and weakness. Death overtakes it rapidly, usually within 24 hours. The disease is frequently associated with posterior paralysis.

Only a small number of kits are affected on any one ranch. Rarely does the disease cause losses of an alarming proportion. It may appear in three or four out of 200 to 300 litters.

(*Continued on page* 193)

Nervous Disease of Domesticated Animals Caused by Filaria (Setaria Digitata)

The following annotation is a bare summary of papers dealing with a substantial quantity of work. It should be sufficient to bring to the attention of readers of VETERINARY MEDICINE some important facets of research which should be of interest to veterinarians, parasitologists, pathologists and workers in tropical medicine. These suggestions regarding the etiology of a peculiar form of nervous paralysis are thus pointers to possibilities and repercussions.

Emoto (1927) described a form of lumbar paralysis of goats originally imported into Japan from Switzerland, where the disease was unknown. It occurred seasonally in the late summer and autumn, affected mostly adult goats, which, symptomatically, showed varying degrees of acuity of onset, course and severity of paralysis affecting hind limbs only or all four. The pathological process was stated to be that of a lymphocytic meningitis with cerebrospinal malacia, caused by streptococci; an infectious cause was later refuted by Hashezumi (1940). Innes (1951) studied the pathology of a few cases of lumbar paralysis of goats in Ceylon; this work had emanated from some observations of Crawford (1939-42) and later of Pillai and Malkani (1950) on the field aspects of this disease.

The essential lesion in this condition was regarded as a necrotising, patchy type of encephalomyelomalacia, with production of discrete foci occurring mainly in the brain stem or only the spinal cord. The process had many unique pathological features and was unlike that in any known disease of ruminants (or of other animals and man) although from the written descriptions it seemed similar to that disease studied by Emoto. Attention was drawn to the spongy state of the severe lesions, to secondary degeneration of nerve fibres and bizarre swellings of axis cylinders in, above, and below the lesion and to inflammatory cell infiltrations with eosinophils which involved meninges. Although pathological examinations have been too inadequate, even the vague clinical descriptions indicate the possibility that a similar disease might have occurred in Iran (Delpy and Kaweh, 1937) and India (see Muktesar Imperial Research Institute Reports, 1932-42). "Kumri"—a paraplegia of horses in India and Burma might also have some points of resemblance. Analysis of all existing information indicated that there was little evidence to incriminate any specific cause for the caprine paralysis and clearly further investigations were required in Ceylon (Innes, 1951). However, work which was done during the war in Japan, and which has just come to the attention of the writer, may throw an entirely different complexion on the whole problem. The results as given in the Japanese papers have now been amplified by much information received in correspondence with the three Japanese workers.

Yamagiwa, Shoho, Tanaka, *et al.* (1941-45) dealt with a paralytic disease of sheep and horses which occurred in most parts of Japan and Korea. There was a similar seasonable incidence and a comparable array of acute, or subacute, paralytic signs and symptoms, as in the case of the goat disease in Ceylon. The pathological lesions described, and illustrated, had many of the hallmarks of resemblance to those mentioned above. The most salient and valuable features of their studies lie, however, in their explanation of cause as no similar parasitic agent (filaria) has ever been established as producing nervous disease of man or animals. It was stated that the microfilaria of *Setaria digitata* (natural host, cattle) were transmitted by mosquitoes and invaded the cranial cavity and vertebral canal and from thence the nervous system—the name of the disease thus being coined, setariosis.

Although the publication has been so far unobtainable, there is a report of a Special Research Commission (Korean — 1939-43) which apparently covered much work, including that on the experimental side; perusal of this would be valuable in regard to demonstrable proof of the cause of this strange animal paralysis. Yamagiwa and his colleagues state that no doubt could exist regarding the identical nature and cause of the lumbar paralysis of goats in Japan and Korea. It would be of prime importance if confirmation of these results could be obtained quickly in the case of the caprine paralysis in Ceylon. Examination of a few sections representing typical lesions of the Japanese disease, however, revealed changes identical to those observed in the Ceylonese goats. No microfilaria larvae nor adult nematodes were found in the latter. This fact may not be surprising for Shoho stressed that parasites must be sought in fresh lesions of acute cases. Many other facts might indicate that there is a unity of disease process (animals in Japan and Ceylon) but these cannot be dealt with here. Pillai, however has stated that in Ceylon the goat disease occurs in

malarial districts and that in one location (6,500 feet above sea level) where there is no malaria and no mosquitoes, no case of this paralysis in goats has been seen in ten years. It is also strange to see that the sheep in Korea and Japan which became affected were imported from Australia, as this is a reiteration of the same phenomenon observed originally by Emoto and by Crawford in the case of the disease in Ceylon. All of the above raises many interesting speculations.

In the Japanese area, the disease seems to be common enough in young horses, sheep, and goats, and from remarks of the Japanese workers it may have been confused in the past with equine encephalitis. Much more detailed pathological examinations of the nervous system are still required of the cases of those other vaguely described paralytic entities of animals in other areas of the Far East. From what has been said, nevertheless, this setariosis might be a widespread condition in animals in the Orient. From this there might be contemplation just how, and why, the nature and causes of so many animal diseases evade recognition as a lengthy list could be compiled. One major factor which influences events undoubtedly must lie in the lack of attention to meticulous pathological observations on animal diseases in the first place.

There is a long way between suggestion and proof of identity of cause but in fact the Japanese work has gone beyond mere postulation. Information from letters and excerpts from the Korean report indicate the Japanese have reproduced the disease (in sheep, at least) without much difficulty. In any case, the work which has been done offers positive possibilities and there may thus be repercussions in other directions and it behooves veterinarians to be aware of the facts as given. Most textbooks on parasitology admit of great ignorance concerning the life cycle of Setara and what they do in natural, or unnatural, hosts and the latter might be the most important. There are leads thus from the parasitological angle. The accidental lodgment of nematodes in the brain of animals has often been commented upon (see Cohrs [1949]) while Schwangart (1940) suggested Setaria might be the cause of endemic paralysis of red deer. There has also been occasional reference to peculiar malacic encephalitic lesions in the nervous system of animals of unestablished cause. It thus should be borne in mind that a comparable disease might occur in wild and domesticated animals in other parts of the world. It is also clear that the same possibility might be envisaged in man for there are many reasons why the disease could be confused clinically or pathologically and the lesion(s) might evade recognition.—*J. R. M. Innes.*

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Streptococcic Septicemia in Mink Kits

(*Continued from page* 191)

Even in the most severe outbreaks, the mortality does not exceed 1%. While the incidence of infected animals on any one ranch is low, the mortality of those affected is high and will approach 100% of those not treated.

Pathology

The autopsy picture presents little that is characteristic. The condition of animals which have died is good. The spleen reveals swelling and a roughened surface. Petechial hemorrhages in the kidneys are common and are the most characteristic postmortem lesions. Petechial hemorrhages in other of the visceral organs are not uncommon.

Treatment and Control

The first affected kits are found dead before the caretaker realizes anything is wrong. The best control procedure is to separate all kits in affected litters to one in a pen in order to prevent spread by direct contact and allow detection of those that refuse food. After the kits have been separated and sick animals are noted, they should be treated with 50,000 to 75,000 units of penicillin in oil. One injection is all that is required in the majority of cases. Penicillin is effective control in this condition and will save most kits affected if treatment is commenced early after appearance of symptoms.

EDITORIAL COMMENTS

Increased Dose of Hog Cholera Serum Recommended

The BAI has issued Virus-Serum Control Memo 51-4 requiring licensed establishments to raise minimum dosage schedules on hog cholera serum labels.

This memo amends order 381, with particular reference to labeling and release of serum. The stated position of the Bureau, in regard to control of postvaccination losses of swine due to the so-called hog cholera variant virus, is based on facts, which now appear to be well established, that once pigs or mature hogs are immunized successfully against ordinary virus they are not susceptible to the variant.

Postvaccination breaks occurred occasionally even before the discovery of the variant in late summer 1949. The condition of the animals at the time of vaccination is still an important factor. If they are in poor condition or are carrying latent infections of other viruses and bacterial disease, some losses may occur. The variant also apparently occurs more readily in some pigs than others. This has been shown in field observations where pigs treated with the same virus, later known to contain the variant, are not affected, while still other lots come down with cholera. Whether or not these breaks are due to the variant alone or to the condition of pigs at time of simultaneous treatment has not been determined.

These amendments, among other things, provide that hog cholera serum labels set forth the following dosage table as the minimum quantity for successful immunization:

Weight	Minimum Dose (cc.)
Suckling pigs	20
Pigs 20 to 40 lb.	30
Pigs 40 to 90 lb.	35
Pigs 90 to 120 lb.	45
Hogs 120 to 150 lb.	55
Hogs 150 to 180 lb.	65
Hogs 180 lb. and over	75

Serum which has passed all prescribed tests satisfactorily prior to April 15, 1951, may be released to the manufacturer for marketing if it bears either the old or new dosage recommendation. All serum in tests concluded after April 15 must bear the label with the new increased minimum dosage table.

It has been suggested that firms provide stickers for the outside of shipping boxes or inclose pamphlets with those that contain products labeled with the old dose legend. These to include the recommendations and minimum dosage schedule that must be applied to serum tested after April 15.

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Changes in Poultry Inspection Regulations Proposed

The Production and Marketing Administration of the Department of Agriculture has announced proposed revision in inspection and grading regulations for poultry which would permit the official grading for quality of only ready-to-cook poultry which has been officially inspected for condition and wholesomeness. Present regulations permit the grading of ready-to-cook poultry which has been inspected by non-official inspectors, such as processing plant employees.

The proposed changes are considered necessary in order to provide more adequate and efficient control of inspection and grading in official plants operating under USDA's grading and inspection service.

The changes proposed would:

1. Limit official grading for quality to ready-to-cook poultry which has been inspected for condition and wholesomeness by federal inspectors or by inspectors of another official inspection system which is acceptable to the administrator.

2. Authorize the use of federal or state employees as inspectors and to conduct inspection operations on a cooperative federal-state basis. Officially designated lay inspectors, as well as veterinarians, would be authorized to act as inspectors.

3. Require all dressed poultry that is handled in an official plant to be processed in accordance with the sanitary requirements contained in the regulations and prohibit dressed poultry coming from other than official plants being brought into official plants.

4. Require inspection for condition and wholesomeness of all poultry eviscerated in an official plant operating under the inspection service and prohibit bringing into such plants any uninspected edible products.

5. Require that a substantial part of the total quantity of poultry processed in an official plant under continuous grading service be submitted for grading for quality, and that such product be packed according to grade.

A.V.M.A. Milwaukee Convention August 20-23, 1951

The 88th annual convention of the A.V.M.A. to be held in Milwaukee, this summer, is expected to draw a record-breaking attendance. This centrally located city will be host to the country's veterinarians for the first time in the history of the Association.

Many fine educational and commercial exhibits are being planned. The scientific side of the meeting will encompass many things of interest to the general practitioner. Entertainment features will appeal to the veterinarian's family, as well as to himself, making this an ideal time and place for a combined educational and vacation trip.

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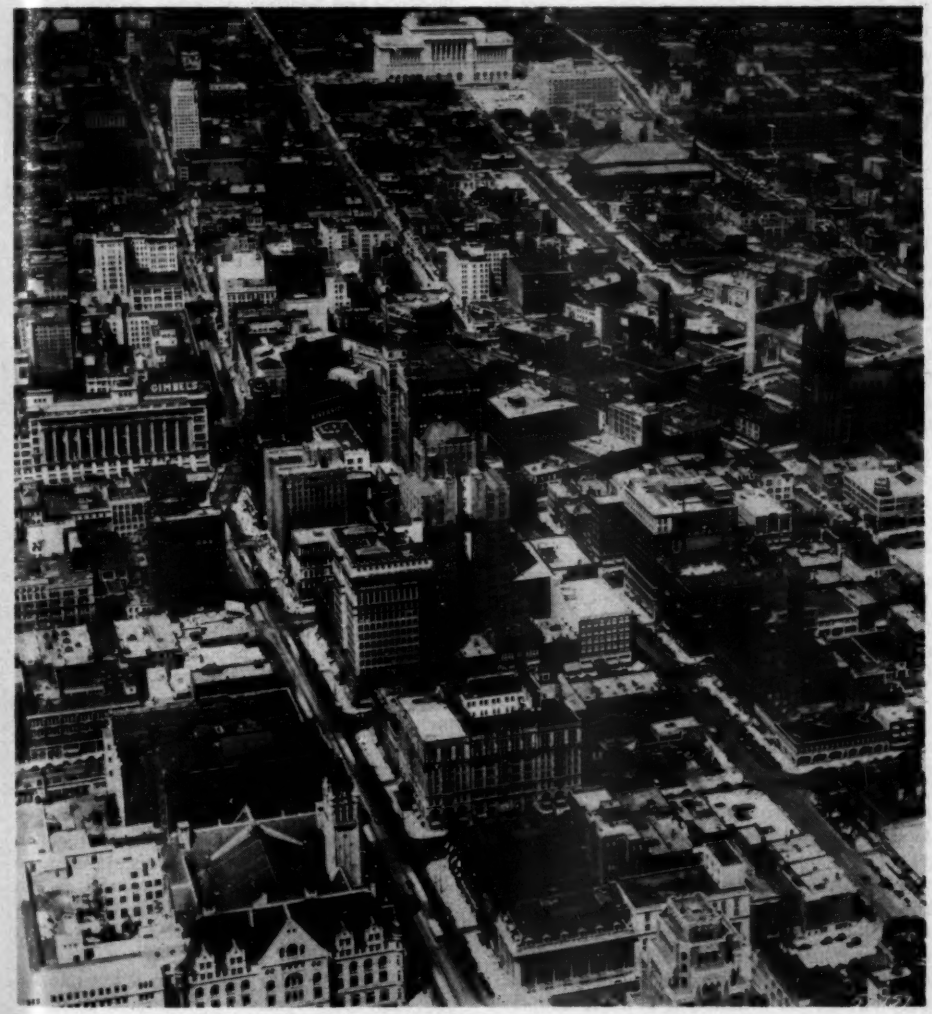
Observations made by Prof. T. Bonadonna in Italy, on the fertility of bulls, as judged by semen examination, give scientific substantiation to common knowledge among breeders that periods of greatest cold and heat are those of lowest fertility. These observations were made after extensive studies on 4,780 dairy cows.



Air view of downtown Milwaukee. Milwaukee County Court House in the background.

What You Should Know About Biological Warfare

A government booklet, titled as above, clearly lists diseases, poisons, toxins, etc., that an enemy might try to use in a BW attack. Such attack would likely be directed at both the population and domestic animals. A number of such agents would serve the purpose. There quite likely may be other agents now unknown or the use of which is not now suspected, which an enemy would choose.

Cholera, plague, typhus fever, smallpox, tularemia, anthrax, glanders, foot-and-mouth disease, rinderpest, are among those listed. In addition to living microorganisms (viruses included), toxins such as botulinus and tetanus might be employed. Chemicals, such as parathion, and others also, offer possibilties as destructive agents that might be delivered by aircraft or guided missiles.

Defenses against BW are well established and at least in urban areas are well manned. These defenses have their nucleus in public health organizations at various echelons and now provide the safeguards for our water and food supplies. The practitioner has a vital role in the protection against biological warfare which is self-evident.

Spreading agents would present difficulties to any aggressor because of the limitation of carriers and the area that could possibly be covered. Furthermore, resistance to disease is inherent in much livestock and in the American people due, partly at least, to the excellence of their nutritive state. Strength in resistance lies not alone in things commonly referred to as military, but in possession of knowledge of the means for defense.

This BW booklet may be obtained from the Government Printing Office, Washington 25, D.C.; the price is 10 cents.

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U.S.L.S.A. Committee Headed by Doctor Biester

Dr. H. E. Biester, associate director of the Veterinary Research Institute at Iowa State College, has been appointed chairman of the Committee on Biologics and Pharmaceuticals of the U. S. Livestock Sanitary Association.

This committee makes recommendations to the Association regarding the efficacy or acceptability of products. The Association is a clearing house for federal, state and territorial officials and its recommendations, though unofficial, are the foundation of rules and laws of procedure.

Yogurt—A New Milk Food Gains Popularity

Eating habits change with the fashion. Public fancy right now has singled out yogurt, a type of cultured milk, and usage in California has doubled within the last few weeks, according to W. B. Woodburn, manager of the California Dairy Industry Advisory Board.

Part of this popularity is due to books on diet currently in the best seller lists and part to a revolving cycle; preparation of yogurt has been known for centuries—formerly with yeast, now with cultures.

In Armenia it is called "mazum", in Egypt "leben", and "dadhi" in India. As defined in the California Dairy Code, yogurt, made commercially, is Grade A milk with non-fat milk solids added. After pasteurization, Bulgarian and related cultures are added, and this resulting product is chilled and packaged for distribution.

The inherent values of the natural proteins, minerals, and vitamins of milk are retained, plus the benefits to digestion which are believed to accrue from action of the cultures. Yogurt is a low calorie food. There are about 170 calories in a half pint.

Once brought again to public mind, yogurt has gone on many slenderizing diet lists, to be used with cereals, as a topping for fruits, in salads and spreads, and for making sauces and gravies, but its largest popularity is when eaten "as is," or with some seasoning added, just about as was the habit many centuries ago.

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The Transmissible Venereal Tumor of the Dog

Neoplasms occurring naturally on the genitals of both male and female dogs have been considered to be of venereal type. With the exception of oral papillomatosis, of viral origin, this tumor is the only known transmissible tumor of the canine species. Experimental transmission may be accomplished by injecting emulsions of tumor cells subcutaneously, intraperitoneally, or intravenously; by bringing fresh neoplastic tissue in contact with scarified skin or mucous membranes; or by implanting tumor fragments in the subcutaneous tissue. Establishment occurs because the tumor cells transplanted into the experiment host are able to grow and multiply in the tissue, and not because of an exciting virus or infectious agent.

The authors state that their studies reveal that the tumor cell is a mature end cell of reticulo-endothelial origin.

Ring or A.B.R. Test for Brucellosis*

The ring or A.B.R. (abortus Bang ring-probe) test is an agglutination test and depends on presence of Brucella agglutinins in milk from infected cattle. Antigen used is stained so that the agglutination reaction may be observed in the presence of milk or cream. In milk from infected cows, the antigen agglutinates and collects on the fat droplets which carrry it to the top to form a cream ring or line having the color of the stained antigen. In negative milk, stained antigen remains in the skim-milk fraction and the cream ring which forms is white.

The A.B.R. test is so sensitive that in a high percentage of cases a positive result is obtained even though the milk from one infected animal is mixed with that from five to ten negative cows. This marked sensitivity permits the use of the test on mixed herd milk or cream from each can on the receiving line in a dairy plant or creamery. Thus, in conjunction with the sero-agglutination test, the ring test serves as a simple, rapid and inexpensive means of locating infected herds.

A single ring test used on an area basis is positive in 70 to 80% of the infected herds. Approximately two-thirds of failures to detect infected herds are due to the fact that the infected animals (usually dry cows and heifers) are not in production at the time of the test. This natural limitation of the test is obviated by employing it at regular intervals of three to six months.

In the United States, approximately 30% of herds positive to the A.B.R. test were found to be negative to the sero-agglutination test. The cause for these discrepancies is still ill-defined. Some are apparently due to mastitis. Some are believed to be due to milk obtained too early after parturition or late in lactation. In some instances, the A.B.R. tests were positive before the sero-agglutination test became positive. Because of the marked sensitivity of the A.B.R. test when used on a herd, it tends to remain positive for a period of time after removal of animals positive to the sero-agglutination test. These discrepancies occur in only a very low percentage of the total number of herds and, therefore, do not seriously interfere with the use of the A.B.R. test as a valuable adjunct to the sero-agglutination test.

*Appendix 3.2.3, Report of the FAO/WHO Expert Panel on Brucellosis. Meetings of the panel were convened Nov. 6-13, 1950 at Washington, D. C. Complete printed report of the first session of this panel meeting will be available in the near future from the WHO Sales Section, and details concerning the preparation of A.B.R. antigens and the performance of the test can be obtained from the Joint Secretary, FAO/WHO Expert Panel on Brucellosis at WHO, Geneva, Switzerland.

Tick Paralysis

Tick paralysis, a form of acute, ascending, motor paralysis, as it occurs in cattle is discussed by Jellison, *et al.*, of the Rocky Mountain Laboratory, elsewhere in this issue. The disease has occurred in the northwestern part of the United States and in British Columbia annually; the number of outbreaks has varied widely each year since first reported in 1915. Paralysis is due to the Rocky Mountain wood tick, *Dermacentor andersoni* Stiles. Relief of paralysis occurs promptly after removal of ticks or by treatment with an efffective tick-killing agent. No marked change in incidence of this disease is anticipated in the area this year, but scattered cases and occasional outbreaks are expected.

Paralysis due to the neurotoxins injected by the tick also occurs in man. Some 94 cases have been recorded in Montana and states of the adjacent region and 101 from British Columbia. Most of the cases have occurred in children during the spring months.

Jellison and Gregson report (*Rocky Mt. Med. Jour.*, 47:28 [Jan.], 1950) that ticks were responsible for two deaths in 1946, in which instances the acarids were found and removed by morticians. In 1947, one death was reported in Washington in which paralysis had progressed too far to effect recovery. In some homes of rural districts, a daily routine search is made for ticks and incipient cases are treated at home, by removing offending parasites, without consulting a physician.

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Use Chlorinated Hydrocarbon Insecticides Cautiously

Spring, season of new life in the barnyard and fields, also means development and activity of parasites that infest them and mankind. Many more will use in larger quantities this year, the newer insecticides that have been shown to be so effective in control of damaging parasites.

Caution is recommended in handling these agents, not alone for the damage excessive application may cause, but for reasons of safety to persons applying preparations containing these poisons. Higher animal life, including man, is unlikely to be harmed if reasonable precautions are taken to prevent excessive inhalation of aerosols or prolonged, intimate skin contact in quantity.

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A.A.H.A., 18th annual convention, Chalfonte-Haddon Hall, Atlantic City, N. J., May 2-5, 1951.

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

Instead of feeding calves high-priced milk, dairymen are beginning to supplant the milk with so-called "replacements." A replacement formula developed at Pennsylvania State College has this composition:

Dried whey	50 lb.
Distillers' dried solubles	10 lb.
Oat flour	5 lb.
Soluble blood flour	10 lb.
Dextrose	7 lb.
Discalcium phosphate	2 lb.
Vitamin A and D feed (500 U.S.P. units D_2 and 4,000 I.U. of A per gm.)	0.5 lb.
Mineral mix (calcium 32%, magnesium 2.6%, manganese 1%, iron 0.175%, cobalt 0.002%, and copper 0.125%)	0.5 lb.

The first four days of life the calf is fed on colostrum.

Beginning the fifth day and including the seventh day, a light breed dairy calf receives 2 lb. milk, 1 lb. water, and 0.2 lb. replacement twice daily; at eight to ten days, 1 lb. milk, 3 lb. water and 0.3 lb. replacement twice daily; 11 to 28 days of age, no milk, 4 lb. water, and 0.4 lb. replacement twice daily; 29 to 42 days, 5 lb. water and 0.5 lb. replacement twice daily; 43 to 49 days, 6 lb. water and 0.6 lb. replacemen twice daily; beginning the 50th day, animals are fed once a day, and for the age 50 to 60 days, 6 lb. of water and 0.6 lb. replacement. The mixtures should be fed at 100 F. Each young calf, of course, also needs up to 5 lb. of "starter" per day; and, as soon as it will take it, some good quality legume hay.

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"Rift Valley fever" is due to a virus. The fever is so named because at this time it is apparently indigenous to the Rift Valley area of East Africa. It is highly infective for sheep and man; it is almost invariably fatal for newborn lambs, though in man, after severe joint and abdominal pains with fever, recovery is usual. The virus is so infective that almost every herder contracted the ailment, as well as those laboratorians handling it. The virus is believed to be air borne.

During the "equine days" we have seen horses go "down behind" after a run of about 100 yards, sometimes more. Then after five or ten minutes of rest, the animal appeared normal only to have the symptoms recur after short violent exertion. The diagnosis was partial occlusion of the terminal branches of the posterior aorta, possibly by parasitic aneurism. We never saw an autopsy as the animals were usually retired for breeding purposes. This week we saw a cow in good flesh, and apparently normal in so far as a clinical diagnosis goes. The only symptom was the going down behind after brief, rapid exertion, and then apparent normalcy after a short rest period. The condition was diagnosed as partial occlusion of the aortic terminals. Since *Strongylus vulgaris* does not occur in cattle, we are at a loss for a complete diagnosis. Calcium deficiency was also considered and treatment for it recommended, together with rest.

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Gradually, research workers are getting closer to solving the riddle of agenized flour; flour bleached and conditioned with nitrogen trichloride. In dogs, canine hysteria has been ascribed to the consumption of rations including nitrogen trichloride bleached flour. Later the blame was placed on a protein factor in the flour. Now Bentley, *et. al.*, ascribe the toxic properties to the amino acid methionine in flour that has been treated with nitrogen trichloride. Strangely, man, mice, rats, and guinea pigs appear to be immune to the toxic properties of agene-treated flour; dogs, ferrets, cats and monkeys are susceptible. Since the use of nitrogen trichloride in the processing of flour has been withdrawn, it is no longer a veterinary problem. It is of interest to know that at this writing ammonium persulfate is receiving serious consideration for processing flour in place of the previously used bleaching agent.

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Large, firm, green cabbage heads (raw or cooked) for either human or animal use are to be encouraged. Cabbage ranks next to citrus fruits and tomatoes in richness in vitamin C, and also contains some thiamine, niacin and riboflavin. It is a valuable food product.

POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

Newcastle disease (pneumoencephalitis) is now generally recognized to be of only minor importance as a disease of human beings. (See DeLay, P.D., Public Health Aspects of Avian Pneumoencephalitis [Newcastle Disease]. *Vet. Med.*, 45:237 [June], 1930). The most recent summary on the disease as it affects man is that of Gustafson and Moses (*Jour. Am. Vet. Med. Assn.*, 118:1, 1951). According to them, there have been only five reported human cases of Newcastle disease identified by isolation of the virus. The recognized manifestations of the disease in man given by these authors are as follows: It is characterized by superficial conjunctivitis without involvement of the cornea. Preauricular lymphadenitis, headache, malaise and chills may accompany the conjunctivitis. No significant rise in temperature has been noted. Recovery is complete in one or two weeks without treatment. In all of the cases reported, including the one described by Gustafson and Moses, there has been definite contact with diseased chickens or with the virus in the laboratory.

It would be of interest to have surveys made on farms where the disease exists in chickens to determine the incidence of conjunctivitis caused by the virus among poultry farmers or among veterinarians that are exposed. It is suggested that all suspected cases be reported to someone capable of aiding in obtaining a laboratory verified diagnosis. Attempts should be made in all such cases to isolate and identify the virus.

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Warfarin is a new rat and mouse control product which apparently can be used with reasonable safety on poultry farms. Warfarin was developed by Dr. Paul Link of the University of Wisconsin, and patent rights are held by the Wisconsin Alumni Research Foundation. It is manufactured under many trade names.

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Males of the dual purpose breeds, like Plymouth Rocks and New Hampshires, are mature enough for breeding when they are seven months of age. Males of the lighter breeds, such as White Leghorns, can be used for breeders when they are six months of age.

Two papers on duck nutrition by Heuser and Scott (*Poultry Sci.*, 30:164 [Mar.], 1951) should be of interest to those of you who have duck farmers as clients. The first of these papers concerns methods of feeding to nine weeks of age and the second is on protein and vitamin requirements. A concise review of the literature on these subjects is included. They found that feeding pellets to ducklings resulted in the highest average weight at four and eight weeks of age. Satisfactory gains in weight were obtained to eight weeks with a ration containing 15% protein, but to two weeks of age, a ration containing 17% gave better gains. Yeast and dried skim milk were found to contain a factor, or factors, which is of importance in the nutrition of ducklings. The addition of 4 to 8% of fish meal to a ration also containing these supplements caused a marked increase in growth. Without milk and yeast, the fish meal was not advantageous.

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Litter for poultry houses varies with the section of the country and local supplies. For example, in California, rice hulls are in common use, while in many Midwestern states ground corncobs are favored. In some sections of Utah a volcanic ash is available and makes a desirable and cheap source. Other types of litter include: shavings, peat moss, sawdust, beet pulp, shredded sugar cane, and sand. Regardless of the type used, it should be kept dry at all times. Some litters such as dried beet pulp and shredded sugar cane have greater tendencies to become moldy than others, and may be the source of aspergillosis or moniliasis.

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Pigeon growers in general believe that pigeons must have a complicated mineral mix to survive and produce young. These mixes often contain also venetian red, sulfur, anise, and powdered gentian for tonic purposes. To test the validity of the use of such mixtures, Platt (*Poultry Sci.*, 30:196, [Mar.], 1951) conducted a series of experiments with White King pigeons. He concluded that none of these so-called tonics were of value and that a combination of 85% oyster shell, 10% charcoal and 5% sodium chloride meets the needs for satisfactory squab production.

PUBLIC HEALTH

JAMES H. STEELE, D.V.M., M.P.H.
Atlanta, Georgia

Hydatid Disease

Hydatid disease or echinococcosis caused by the larval form of the dog and wild canidae tapeworm, *Echinococcus granulosus,* is a world-wide disease of public health significance except in North America. The prevalence of this disease is highest in countries where there are large sheep and dog populations. In Australia, New Zealand, Argentina, Uruguay, Greece, Near East, and North Africa it is a major disease problem of man. A study of 8,000 human cases of hydatid disease in South America revealed that 15% were fatal; or that one died, three were incapacitated, and three recovered, of seven infected. It is a serious public health problem, especially in rural populations. In North America, during the past 40 years less than 600 human cases have been reported. Authorities who have reviewed these believe that most of them were contracted abroad. Infected dogs are very rare or unknown in North America. The disease has been identified in wild animals in Minnesota and adjacent areas of Canada.

Rausch and Schiller (*Science,* 113:2925, 1951) report that *E. granulosus* is well established in Alaska in both dogs and wild canidae. Infected dogs in many arctic Eskimo villages indicate that it may potentially, if not actually, be a serious public health problem. The infection has also been reported in red and arctic foxes and wolves. Moose and caribou are the apparent intermediate hosts on the mainland.

Preliminary studies of native populations on St. Lawrence Island have revealed a high incidence of human reactors to Echinococcus antigen (20 to 28%). No dogs were found infected among the 26 autopsied on the Island but five of seven arctic foxes examined were infected. Reindeer were thought to be the intermediate host but for some years they had not been slaughtered so they would increase in numbers. In view of this, it was necessary to find another explanation of fox infection. During 1950, the tundra vole was found infected with larval *E. granulosus.* Further study established this mammal as the only important intermediate reservoir on the Island. Squirrels and other voles were examined with no evidence of infection. It is known that foxes and dogs feed on these mouse-like animals when they are plentiful. The authors point out that the human population may become infected from eating greens or drinking water contaminated with eggs of *E. granulosus* excreted by infected foxes. The possibility of dog infection and contamination cannot be dismissed even though no infected dogs were found on autopsy. Further studies are planned on the epizootiology and epidemiology of this disease in Alaska and the Arctic.

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The Illinois Department of Public Health has taken a big step forward in the control and eradication of brucellosis. To assist the progressive dairy herd owners in protecting the health of the people of Illinois, the Department will require that all Grade A milk must be produced by brucella-free herds after January 1, 1955. The Illinois Grade A milk law, as do most Grade A milk laws or regulations, requires that the milk be produced by healthy animals. The Illinois Grade A requirements will be felt throughout the Midwest, in as much as Chicago and East St. Louis are large milk importing areas.

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The World Health Organization and Food-Agriculture Organization of United Nations met with a group of their consultants on Bovine Tuberculosis and Zoonoses in Geneva, Switzerland, December 11-16, 1950. Their report will be published by the World Health Organization in the near future. The reports can be obtained from Dr. Martin M. Kaplan, Veterinary Consultant, WHO, Geneva, Switzerland, or the International Documents Service, Columbia University, New York, N. Y.

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The School of Hygiene of the University of Montreal is now accepting veterinarians in its public health course. Candidates for the diploma of veterinary public health will take courses to qualify them for supervisory positions in public health. The curriculum will stress animal diseases transmissible to man, sanitation and public health administration and practices.

VETERINARY PARASITOLOGY

A. O. FOSTER, B.A., M.A., Sc.D.
Beltsville, Maryland

Lesions Caused by Pinworms

Symmers[4] has written a convincing article on the injuriousness of pinworms, *Enterobius vermicularis*, with particular reference to the association of this parasite with granulomata and other problematical lesions and symptoms that present diagnostic difficulties to the internist and surgeon. Because related parasites are found in almost all classes of animals, the report seems worthy of noting by veterinarians.

Pinworms of animals, like the species in man, deserve much study, and practitioners are in an excellent position to make significant observations, especially on pathogenicity.

Symmers notes that pinworms are the most prevalent of human parasites. They are often not discernibly injurious and frequently their association with diseased tissue or symptoms is fortuitous. There can be no question, however of the etiologic role of pinworms in granulomata that develop around dead pinworms and about eggs that have been deposited in unusual sites for the parasite. The granulomata are not especially symptomogenic but are encountered in pelvic examination, operations, or necropsy. Three cases are described; two were women who underwent gynecologic operations and the other was a boy who underwent nephrectomy. Complete case studies, with plates are given.

Symptoms and lesions associated with pinworms are fully reviewed under comprehensive headings; symptoms, presence of Oxyuris in atypical sites (cystitis, vulvovaginitis, phimoses, peritonitis, balanoposthitis, fistulas, ureteritis, kidney infestation, eczematous dermatitis, irritation, secondary infections, etc.) appendicitis, intestinal lesions, anorectal lesions, lesions of female reproductive systems and peritoneum ("In all these 23 previously reported peritoneal cases, with the possible exception of five, the result of Oxyuris invasion of the peritoneal cavity was of no clinical significance, the intruder being dealt with — by development of a sclerosing granulomatous reaction, walling it off.").

The granulomatous lesions are thought to be quite common, but often passed off as fibromatous or myomatous, yet their microscopic appearance and histology are characteristic and generally recognizable by one familiar with them.

[4]Symmers, W. St. C., Pathology of Oxyuriasis. *Am. Med. Assn., Arch. Path.*, 50:475 (Oct.), 1950.

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Practical Control of Sheep Ticks

Dipping is the time-honored, and undoubtedly the most reliable, method of eradicating sheep ticks, but recent studies by many workers, including Denning,[6] of Wyoming, and Seghetti,[7] of Montana, make it clear that dipping can no longer be regarded as the only practicable means of controlling these parasites. Denning obtained good results from power-dusting with 0.5% rotenone in a carrier, such as pyrophyllite, with 2% SAE 10 motor oil. Seghetti has shown that adequate hand-spraying, at 400 pounds pressure, with preparations containing 0.5% DDT, toxaphene, or chlordane, or 0.06% lindane, provides good control for at least 40 days. Wettable insecticides were used and the materials applied with a three-nozzle gun on a two-foot handle. For dipping purposes, it will be recalled that all of the common chlorinated insecticides, except BHC, provide effective control when used at a concentration of 0.25%. For BHC, the recommended concentration is 0.025% of the gamma isomer. The dilute rotenone dip, prepared with 6 to 8 oz. of derris or cube powder containing 5% rotenone, or the equivalent thereof, is also among the many efficacious methods of control.

[6]Denning, D. G., *Jour. Econ. Ent.*, 42:852, 1949.
[7]Seghetti, Lee and Firehammer, B. D., *Jour. Am. Vet. Med. Assn.*, 117:447, 1950.

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A recent paper[†] subscribes to the view that human balantidiasis (*Balantidium coli* infection) is contracted from swine, in which the parasite commonly occurs. Excellent data are given on 16 patients (one-fourth of the total cases reported for the United States), all but one from rural areas. Of the seven adults, six were farmers. Three families raised pigs, and the others are presumed to have had contact with these animals. Carbarsone was regarded as the most promising drug for human infections.

[†]Swartzwelder, J. C., Balantidiasis. *Am. Jour. Dig. Dis.*, 17:173 (June), 1950.

Sequela of "Clamping" Bulls

NORMAN E. SCHULZ* and HUBERT C. SEBOLT*

On January 12, 1951, two male Aberdeen-Angus were presented at the clinic, School of Veterinary Medicine, University of Missouri, Columbia, each having an extremely swollen scrotum. The scrotum was about the size of an inflated football on animal A and only slightly smaller on animal B. Both animals showed pain on digital palpation. The temperatures were 101.2 F. and 101.4 F., respectively. Blood count of animal A, 5,910,000 R.B.C. and 13,250 W.B.C.; animal B, 4,600,000 R.B.C. and 11,900 W.B.C. History of both animals was that they had been "clamped" at the stockyards prior to sale as feeder steers. Following the sale the scrotum of each began to swell and anorexia was noted. Careless application of clamping technic, causing severe injury to the epididymis, was the probable cause.

Fig. 1. Note size of scrotum in comparison to operator's hand.

Surgical Procedure

Both animals were put on the operating table and prepared for surgery. On incision, a purulent fluid with a consistency of heavy cream escaped from the scrotum of animal A, while that from animal B was quite fluid. Both exudates were fetid. Cultures proved negative.

Testicles were necrotic and partly disintegrated; the cords were greatly swollen, being about one inch in diameter.

Cords were ligated and severed as near to the external inguinal ring as possible and the scrota removed at their bases. Sulfathiazole powder was applied and the wounds were allowed to remain open. Both animals were given 1,500 units of tetanus antitoxin.

Fig. 2. Cross section of the scrotum and epididymis showing extensive tissue changes.

The second day following surgery, animal A had a blood count of 3,500,000 R.B.C. and 9,000 W.B.C. Animal B had a blood count of 1,550,000 R.B.C., 29,500 W.B.C., and 55% hemoglobin. Animal A received 1,500 cc. defibrinated blood while animal B received 1,000 gr. sulfamethazine with 10 cc. vitamin C intravenously and 2,000 cc. physiological saline intraperitoneally.

Animal A received no further treatment, but because of the low red blood count, animal B was given 4,000 cc. whole blood (defibrinated) on the fourth day, 1,500 cc. on the fifth day, and 900 gr. sulfathiazole on the 12th day.

Both animals made uneventful recoveries and were released on the 14th day after admission.

*Senior Student, School of Veterinary Medicine, University of Missouri, Columbia.

BOOK REVIEWS

Books reviewed in this department and any other books, if available, may be obtained by remitting the published price to the Book Department, Veterinary Medicine, Suite 803 Livestock Exchange Building, Kansas City 15, Missouri.

HANDBOOK ON THE HANDLING OF ANIMALS AND FIRST AID. Issued by the National Veterinary Medical Association of Great Britain and Ireland (N.V.M.A. Pub. No. 20). 172 pages, with 31 figures and 3 plates.—Price $1.00 (approx.).

This little book has been prepared by the British association in response to requests by various organizations seeking guidance from the veterinary profession in providing material for the instruction of young people in the application of first aid to injured animals or those which have become suddenly ill.

Approach, handling and control of farm animals are outlined and illustrated in a fashion that will instill confidence in the student. Small animals (dogs and cats) are treated separately. Brief discussions on anatomy and physiology precede chapters on dressings and bandages and the administration of drugs. Considerations in the control of hemorrhage and first aid treatment of wounds are presented under their respective headings.

The book will be useful to supplement Boy and Girl Scout manuals on First Aid to Animals and for the councilor examining aspirants for merit badges. It will also prove to be interesting reading for the sincere lay assistant of the practitioner.

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MEAT HYGIENE, by *A. R. Miller,* D.V.M., LL.B., Chief of the Federal Meat Inspection Service, USDA, Washington, D. C. 420 pages, 89 illustrations, charts and diagrams. Lea & Febiger, Washington Square, Philadelphia 6, Pa., publishers, 1951.—Price $7.50.

Americans take the safety of their meat supply for granted. Travelers appreciate that meat hygiene as developed and practiced here assures the consumer of meat or meat products that those bearing the purple stamp of the Federal Meat Inspection Service are wholesome. Gains in public confidence in the meat offered have been continuous since the passage of the Meat Inspection Act of 1906. Regulations prepared and revised are stringent safeguards. Consumers have the comforting assurance that inspected meat is not only prepared under clean and sanitary conditions, but from animals free of disease. The purple legend designates the safest meat in the world.

The author of Meat Hygiene covers the entire field of "manufacture" of meat. Environmental sanitation, necessary facilities for production of clean meat, preparation, labeling, adulteration and merchandising, as well as antemortem and postmortem inspection, are given detailed consideration.

In chapter 4, common diseases of market livestock are discussed under four general headings: description and class of animals involved, etiology and pathogenesis, lesions, and postmortem significance.

Trichinosis is discussed in a separate chapter containing 20 pages.

Presented in textbook style, Meat Hygiene is addressed primarily to veterinary students and veterinarians interested in meat inspection activities at any political division or subdivision.

An appendix contains useful and practical information for all readers because of the legislation and regulations that apply to meat and food inspection included.

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THE BOSTON TERRIER, by *Vincent G. Perry*. Third edition. 159 pages, 205 illustrations. Judy Publishing Co., Chicago, publisher, 1950.—Price $3.50.

Written by an international judge and breeder of champions, The Boston Terrier, a breed book, is a completely revised third edition of a treatise on this perennially popular, American-originated breed of dog.

The author gives what is known of the origin, history and early development of the breed. Authentic, expert material of value to breeder and judge is included on the official standards of the breed and evaluation of points of the show card. This is written understandably.

Like others in the series of Judy Breed Books, this one contains much useful information of general character applicable to all breeds of dogs.

VETERINARY ITEMS OF INTEREST

Workers in Illinois have contributed experimental evidence to show that bull sperm reaches the ovarian portion of the oviduct 11 minutes or less after depositing semen in the cervix by artificial means.

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Pachyderm Surgery

Fifty years a veterinarian, and for most of this period engaged in private practice, is the achievement record of Dr. J. D. Cluts, Canton, Ill. Doctor Cluts, still in active practice, is shown removing a fragment of glass from a circus elephant's foot.

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In beef cattle numbers, Florida with 1,200,000 head, ranks 12th in the nation and leads the Southeast in this respect.—*Southern Livestock Jour.*

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Concomitant administration of a sensitizing antigen and either ACTH or cortisone to normal rabbits, according to Germuth and Ottinger, prevented the development of hypersensitivity and suppressed antibody formation.

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According to the World Health Organization (WHO), more than three-fourths of the world's population are victims of disease resulting from unfit food and water supply, and inadequate sanitary practices.

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Reports from Washington indicate that the administration is formulating a huge subsidy plan—the purpose is to hold down retail prices of meat, dairy products and some other common foods. It will be patterned after the World War II program and it is estimated will cost the taxpayer some $1,500,000,000. annually.

Enterotoxins produced by microorganisms associated in bovine mastitis may be causative factors in food poisoning.

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Incomplete digestion represents the most variable and often the largest loss to an animal of the potential energy supplied by the ration.

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This year's official National Dog Week poster design, carrying the slogan "At Your Service . . . All-Ways" will feature famed German Shepherd dog, Rin Tin Tin III.

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A group of 23 patients were relieved completely of asthmatic symptoms by parenteral injections of ACTH. Remissions induced lasted from four days to over ten months.

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An outbreak of sheep scabies in California is reported and quarantine has been placed on 14 premises. The state has been free of this disease since 1931. The present outbreak is claimed to have occurred among a band recently shipped from the Southwestern range country.

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Pest and weed control by chemicals applied by aircraft has become a practical and economical procedure in many farm operations. In California alone 1,916,874 acres were so treated in 1950.

Danger of accumulation of these chemicals in the soil is inherent in the practice. Treated soils may become toxic for sensitive plants unless care is exercised in the rate and frequency of application.

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The trend toward more fall pigs during recent years has affected hog marketing practices formerly established. In 1950, according to government report, the fall crop made up 40% of the year's total. In some parts of the south and central Corn Belt, Missouri, Indiana and Ohio, fall-farrowed pigs nearly equalled those produced in these regions during the spring months. Growers in most sections of the country are realizing larger returns on current investments employing the two-crop system.